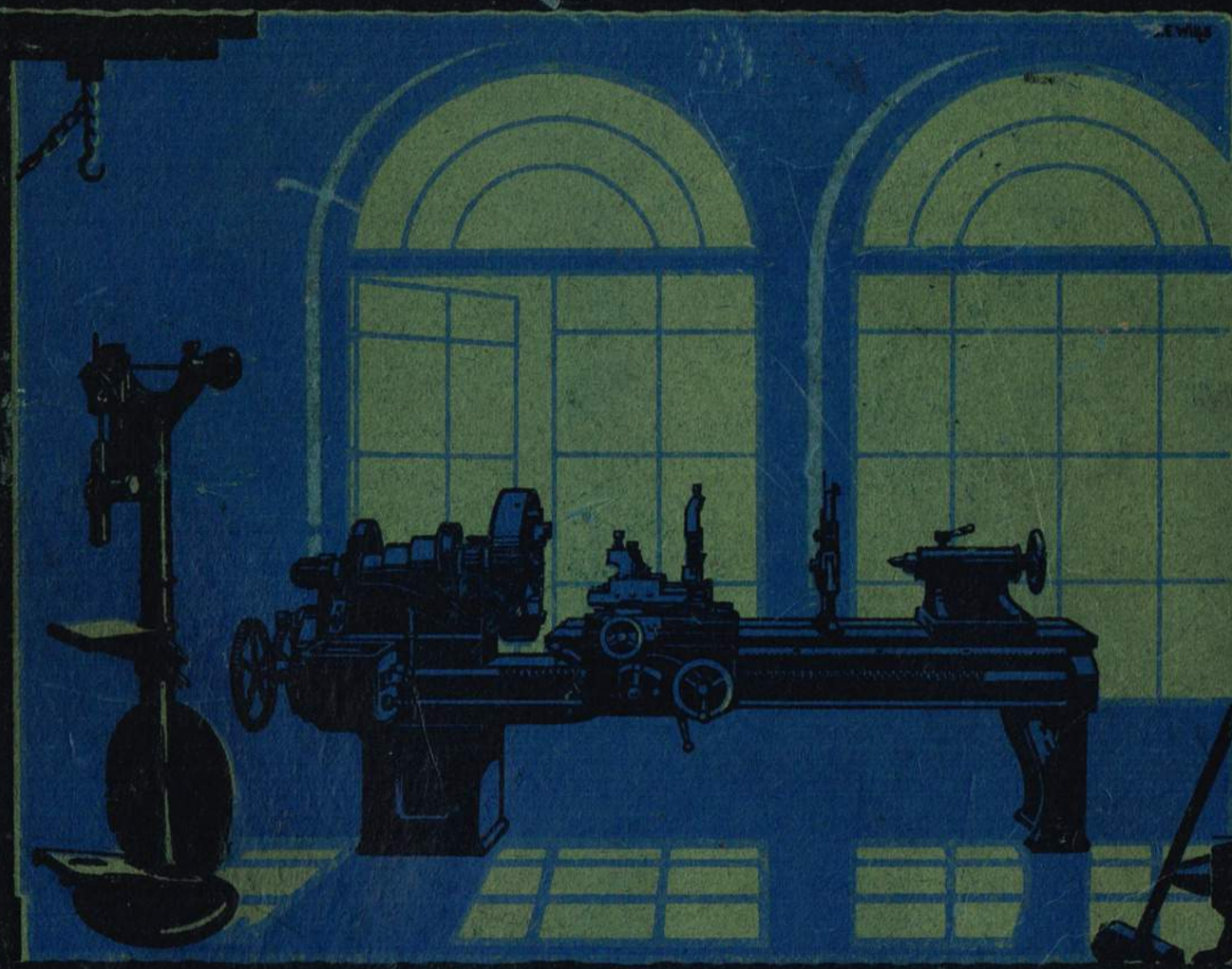
CATALOGUE

T.C.JONES &

HAND AND MACHINE TOOLS.

WOOD LANE — — — LONDON, W.12.



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LIST No. G12/25.

T. C. JONES & Co., Ltd.

Merchants, Manufacturers, Engineers,
:: :: Structural Engineers :: ::
Iron and Steel Stockholders

General Catalogue

of

Hand and Machine Tools, and Supplies for Engineers, Woodworkers, Contractors, Railways, and Workshop Equipment for All Mechanical Trades

Head Office, Showrooms & Works:

93, 95, WOOD LANE, SHEPHERD'S BUSH

Opposite Wood Lane (Central London) Railway

LONDON, W. 12.

Private Railway Sidings:
G.W.R. and L.M.S. RAILWAYS

Telephone Numbers:
Park, 6540, Private Branch Exchange

Telegrams:
"Ironoxid, Shepherds, London"

Printed by
R. Seed & Sons, Printers, 43 Guildhall Street.
1925.

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PREFACE.

IN our General Catalogue of Hand and Machine Tools and Supplies, you will find all those articles generally used by Engineers, Contractors, Woodworkers, and for general workshop equipment. If you do not see exactly what you need, we shall be pleased to quote you for it. **Designs and List Prices** have been brought up-to-date as far as possible. **Discounts** vary according to market fluctuations, but you can rely upon our quoting you the lowest ruling prices current at the time of your application.

The making of wrought iron and steel tools and, in fact, every description of wrought iron work to our clients' own specifications is one of our specialities. A department is devoted exclusively to this work and we can promise prompt delivery because our stock of material is unusually large.

On the following pages are reproductions of photographs at our works, which comprise Engineering Section, Steel Building Section, Iron Railing Section and Stores, comprising General Hardware, Steel Joists, Angles, Flats, Bars, etc., etc.

You will find our Catalogue a useful reference guide, and we can assure you of our prompt attention to any enquiries with which you may favour us.

T. C. JONES & CO., LTD.

ILLUSTRATIONS. Owing to the continual improvements in design of articles none of the illustrations can be taken as binding.

TERMS.

PRICES. Are subject to alteration without notice but our customers can rely upon our quoting lowest market prices.

We reserve the right to correct errors in quotations, and we cannot be held responsible for delays or non-fulfilment of contract caused through strikes, acts of providence or causes beyond our control.

No cancellation of contract can be made without our consent.

MONTHLY ACCOUNTS. Nett cash, payable on the 10th of the month following delivery

NEW ACCOUNTS. If no account has been opened, remittance or trade references should accompany order.

CARRIAGE. Prices quoted are F.O.R. our sidings or loaded our warehouse, unless otherwise arranged.

FOREIGN ORDERS. Payment to be made through Bankers or London agents.
Foreign indents executed for any class of Tools, Machinery or Supplies. We send out original invoices and charge a small percentage as buying and shipping expenses.

PACKING. Charged at cost price, but [illegible] in good condition, carriage paid within 14 days of delivery.

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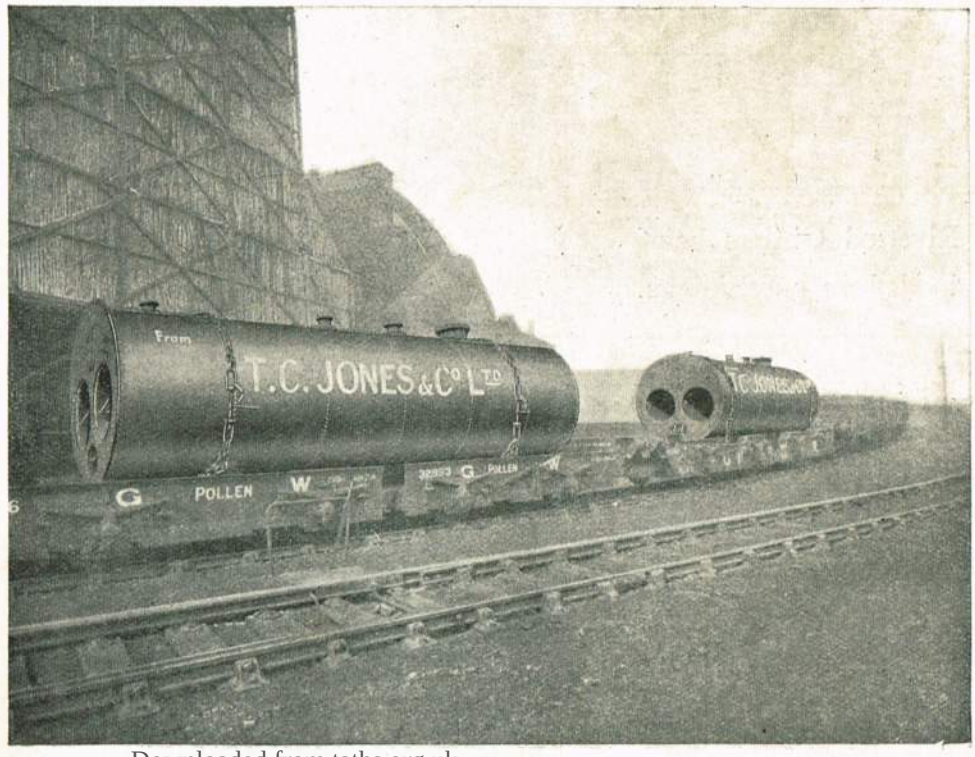
Deliveries by Road or Rail.

Two Galloway Boilers leaving our Sidings.



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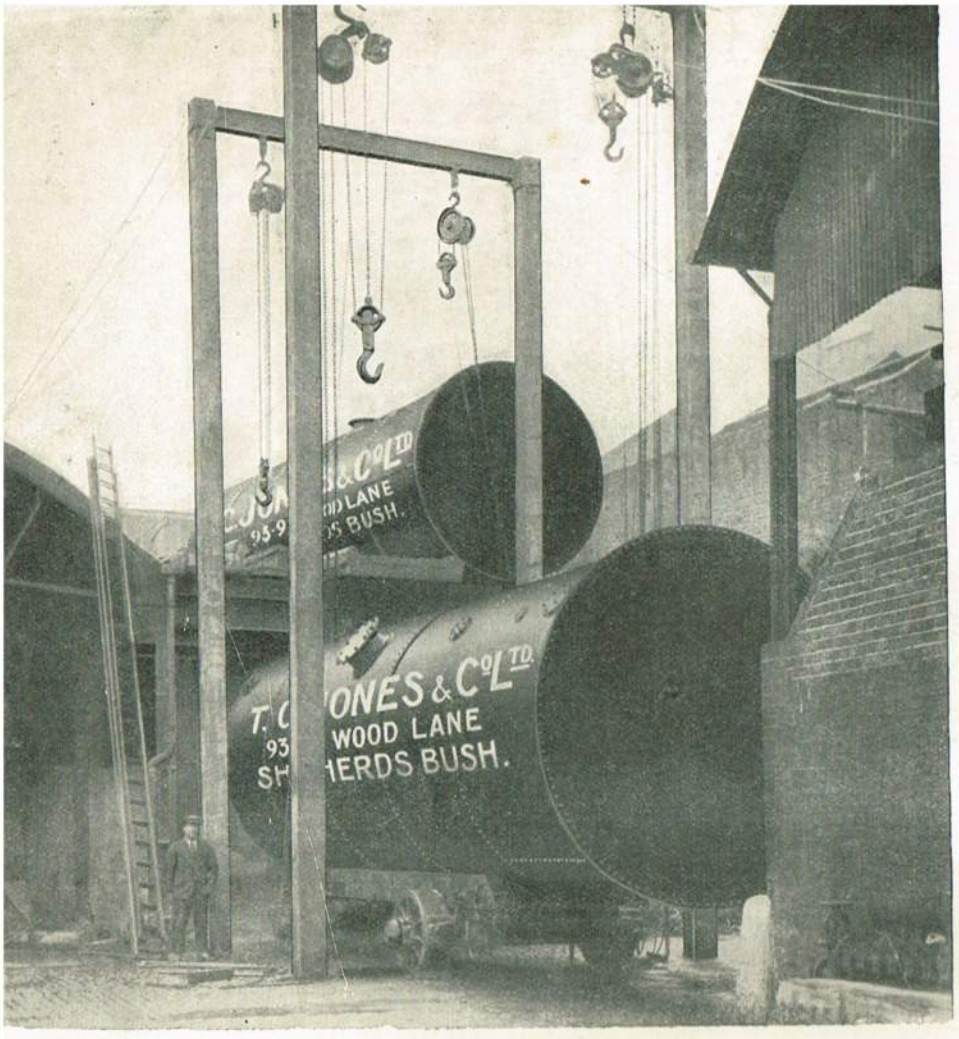

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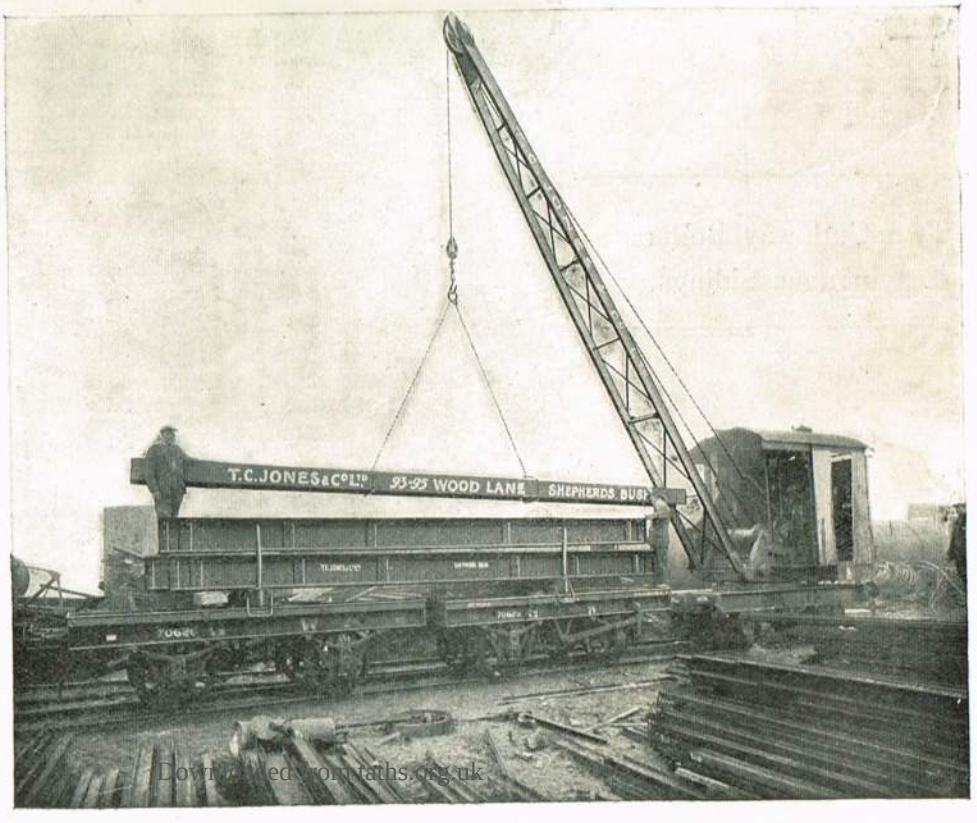

Rivetted Girders being loaded on our Sidings.

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TAPS.

HAND TAPS.

Made in	Fig. 1 Whitworth.	Fig. 2 B.S.F.	Fig. 3 Cycle.	Fig. 4 Brass.	Fig. 5 Conduit.	Fig. 6 A.S.M.E.	Fig. 7 S.A.E.	Fig. 8 U.S.S.

When ordering Machine Taps add the letter **A** to above Figure Numbers.

The Prices shewn are for any of the above at corresponding cutting sizes.

Diameter, inches	....1/16 to 3/32	1/8 to 7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2	9/16	5/8	11/16
Price each—Hand tap	.... 1/9	1/2	1/5	1/6	1/8	1/9	1/10	2/3	2/6	2/8	3/–	3/6
,, Machine Nut tap	—	2/6	2/10	3/-	3/4	3/6	3/8	4/6	5/–	5/6	6/–	6/9
Diameter, inches	3/4	13/16	7/8	15/16	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
Price each—Hand tap	4/–	4/8	5/4	6/–	6/8	9/4	10/10	15/–	18/–	22/–	26/–	33/–	36/–
,, Machine Nut tap	7/9	9/–	10/6	12/–	14/–	19/11	24/–	29/6	36/6	44/–	51/3	58/–	67/–

Fig. 9. GAS TAPS. HAND.

Diam., ins.	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2
Price each	2/3	2/8	3/6	5/4	6/4	7/6	9/6	11/–	15/9	21/9	25/9	31/6

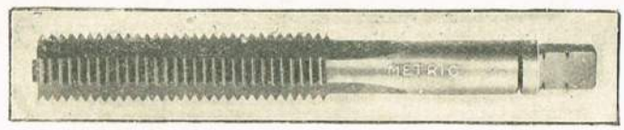

Fig. 10. METRIC (S.I.) HAND TAPS.

Diam. m/m.	3	4	5	6	7	8	9	10	11	12	14	16
Pitch m/m....	.5	.75	.85	1.0	1.0	1.25	1.25	1.5	1.5	1.75	2.0	2.0
Price each	1/2	1/2	1/2	1/5	1/6	1/8	1/9	1/10	2/3	2/6	2/8	3/–
Diam. m/m	18	20	22	24	30	33	36	39	42	45	48	52
Pitch m/m	2.5	2.5	2.5	3.1	3.5	3.5	4.0	4.0	4.5	4.5	5.0	5.0
Price each	3/6	4/–	5/4	6/8	9/4	10/10	15/–	18/–	22/–	26/–	33/–	36/–

Hand Taps are made Taper, Plug and Bottoming, or First, Second and Third.

Left-hand Taps at special rates, quoted upon application, except Whitworth Left-hand Taps, which are same price as right hand.

Machine Taps can be supplied same length as Hand Taps, unless stated, but the shanks are not squared. Same prices as ordinary Hand Taps.

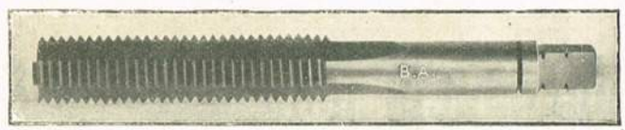

Fig. 11. BEST WARRANTED BRITISH ASSOCIATION TAPS.

No.	0	1	2	3	4	5	6	7	8	9	10	11	12
Diameter in m/m	6.0	5.3	4.7	4.1	3.6	3.2	2.8	2.5	2.2	1.9	1.7	1.5	1.3
Pitch in m/m	1.0	.9	.81	.73	.66	.59	.53	.48	.43	.39	.35	.31	.28
Price Hand Tap, each	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/3	1/8	1/8	2/6	2/6
Price Machine Tap, each	2/6	2/6	2/6	2/6	2/6	2/6	2/6	2/6	2/6	—	—	—	—

Special Pitches made to order in a few days.

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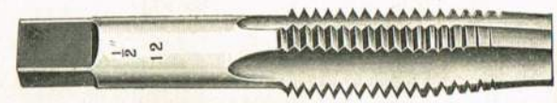
TAPS.

BEST CAST STEEL ENGINEER'S TAPS. Whitworth or B.S.F. Thread same price.

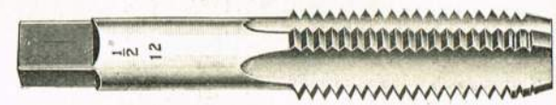
Taper. English pattern.

Taper. American pattern.



Second. English pattern.

Plug. American pattern.



Plug. English pattern.

Bottoming. American pattern.

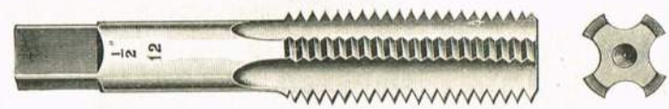


Fig. 12. 3-Flute. **Fig. 13. 4-Flute.**

Prices of either pattern.

Diameter, inches	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1 1/8	1 1/4
Whitworth threads per inch	40	24	20	18	16	14	12	12	11	11	10	9	8	7	7
B.S.F. threads per inch	—	—	26	22	20	18	16	16	14	14	12	11	10	9	9
Price each	**2/–**	**2/–**	**2/–**	**2/2**	**2/4**	**2/8**	**3/–**	**4/–**	**4/–**	**5/–**	**5/–**	**6/6**	**8/–**	**10/–**	**13/–**
Diameter, inches	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2					
Whitworth threads per inch	6	6	5	5	4 1/2	4 1/2	4 1/2	4	4	4					
B.S.F. threads per inch	8	8	8	7	7	7	7	6	6	6					
Price each	**17/–**	**21/–**	**26/–**	**32/–**	**39/–**	**47/–**	**58/–**	**70/–**	**82/–**	**96/–**					

Fig. 14. Whitworth. **Fig. 15. B.S.F.**

Best Quality Machine Taps Whitworth and B.S.F. Threads, same price.

Each Tap is threaded 2/5 of its full length. Each tap is threaded 3/5 of its full length.

Diameter, inches	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	
Price each of **Fig. 14.**	**3/–**	**3/–**	**3/3**	**3/9**	**4/6**	**5/6**	**5/6**	**6/9**	**6/9**	**8/9**	**8/9**	**11/–**	
Price each of **Fig. 15.**	**3/3**	**3/3**	**3/9**	**4/6**	**5/6**	**6/9**	**6/9**	**8/9**	**8/9**	**11/–**	**11/–**	**15/–**	
Diameter, inches	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2
Price each of **Fig. 14.**	**11/–**	**15/–**	**20/–**	**25/–**	**32/–**	**40/–**	**48/–**	**56/–**	**66/–**	**76/–**	**89/–**	**104/–**	**120/–**
Price each of **Fig. 15.**	**15/–**	**20/–**	**25/–**	**32/–**	**40/–**	**48/–**	**56/–**	**66/–**	**76/–**	**89/–**	**104/–**	**120/–**	**140/–**

Master Taps are supplied full size, i.e., the depth of thread larger than the listed diameter. This type is most suitable for threading split dies.

Sizes and Prices of (Fig. 16) **Master Tap** in Whitworth Standard and (Fig. 17) British Standard Fine.

Diameter, inches	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1
Price each	**3/3**	**3/6**	**3/9**	**4/–**	**4/6**	**5/–**	**6/–**	**7/6**	**7/6**	**9/6**	**9/6**	**12/–**	**12/–**	**15/–**	**15/–**
Diameter, inches	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	
Price each	**18/6**	**23/–**	**28/–**	**34/–**	**42/–**	**52/–**	**64/–**	**78/–**	**94/–**	**112/–**	**132/–**	**154/–**	

Left Hand Taps advance 33⅓%.

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PIPE TAPS

Fig. 18.
Taper Pipe Tap.

Fig. 19.
Plug Pipe Tap.

Fig. 20.
Master Pipe Tap.

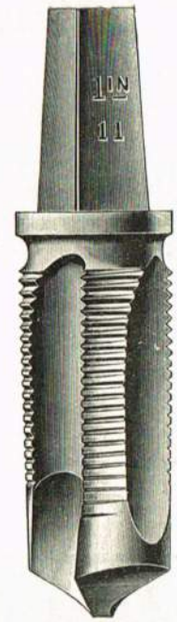

Fig. 21.
Drill Reamer Tap.
with 3 cutting lips.

Fig. 22.
Machine Taps Pipe Threads.

All these Pipe Taps are British Standard, manufactured from the finest steel, and are being used by the largest gas companies throughout the world. Made of the finest material and highest standard of efficiency. The Master Taps are supplied full length, size 1, 8. The depth of thread larger than the taper and plug taps.

Diameter .... ins.	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3
Threads per inch	28	19	19	14	14	14	14	11	11	11	11	11	11	11	11	11
Fig. 18. Price each ...	**2/4**	**2/6**	**3/–**	**4/–**	**5/–**	**6/–**	**7/–**	**8/–**	**11/–**	**13/–**	**19/–**	**27/–**	**37/–**	**47/–**	**60/–**	**92/–**
Fig. 19. Tap, each ...	**2/4**	**2/6**	**3/–**	**4/–**	**5/–**	**6/–**	**7/–**	**8/–**	**11/–**	**13/–**	**19/–**	**27/–**	**37/–**	**47/–**	**60/–**	**92/–**
Fig. 20. Price each ...	**4/–**	**5/–**	**6/–**	**7/6**	**9/–**	**10/6**	**12/6**	**15/–**	**17/6**	**21/–**	**30/–**	**42/–**	**58/–**	**75/–**	**95/–**	**150/–**
Fig. 21. Price each ...	—	—	**9/–**	**9/6**	**12/–**	**14/–**	**16/6**	**16/6**	**23/–**	**23/–**	**30/–**	**40/–**	**46/–**	—	—	—
Fig. 22. Price each ...	**4/–**	**4/6**	**5/3**	**7/–**	**11/–**	**11/–**	**17/–**	**17/–**	**26/–**	**26/–**	**32/–**	**55/–**	**70/–**	**98/–**	**123/–**	**175/–**
Length of Fig. 22 in inches	3 1/2	4	4 1/2	5 1/2	6	6	7	7 1/2	8	8 1/2	9	10 1/2	11 1/2	12	13	14

FIG. 23. BEST CAST STEEL BOILER STAY TAPS.

With threads relieved.

Customers should state on order number of threads per inch required, also length of parts A, B, C, D, E, F. The lengths C,D,E should be specified to suit the water space to be spanned.

A. Head. F. Plain. E. Rimer. D. Taper. C. Parallel. B. Shank. A. Head.

Stay Taps are usually proportioned one-fourth of total length head and shank, one-fourth parallel thread, one-fourth taper thread, one-fourth rimer, guide and head ; and the following prices apply when the threaded part does not exceed one-half of total length.

Total length	16	18	20	22	24	26	28	30	32	34	36	38	40	ins.
Diameter														
3/4"	**24/–**	**27/–**	**30/–**	**33/–**	**36/–**	**39/–**	—	—	—	—	—	—	—	each
13/16" 7/8"	**32/–**	**36/–**	**40/–**	**44/–**	**48/–**	**52/–**	**56/–**	—	—	—	—	—	—	,,
15/16" 1"	**40/–**	**45/–**	**50/–**	**55/–**	**60/–**	**65/–**	**70/–**	**75/–**	**80/–**	**85/–**	—	—	—	,,
1 1/16" 1 1/8"	**48/–**	**54/–**	**60/–**	**66/–**	**72/–**	**78/–**	**84/–**	**90/–**	**96/–**	**112/–**	—	—	—	,,
1 3/16" 1 1/4"	**56/–**	**63/–**	**70/–**	**77/–**	**85/–**	**92/–**	**99/–**	**106/–**	**113/–**	**120/–**	**127/–**	**134/–**	**141/–**	,,
1 5/16" 1 3/8"	**64/–**	**72/–**	**80/–**	**88/–**	**96/–**	**104/–**	**112/–**	**120/–**	**128/–**	**136/–**	**144/–**	**152/–**	**160/–**	,,
1 1/2"	**72/–**	**81/–**	**90/–**	**99/–**	**108/–**	**117/–**	**126/–**	**135/–**	**144/–**	**153/–**	**162/–**	**171/–**	**180/–**	,,
1 5/8"	**80/–**	**90/–**	**100/–**	**110/–**	**120/–**	**130/–**	**140/–**	**150/–**	**160/–**	**170/–**	**180/–**	**190/–**	**200/–**	,,
1 3/4"	**92/–**	**103/6**	**115/–**	**126/6**	**138/–**	**149/6**	**161/–**	**172/6**	**184/–**	**195/6**	**207/–**	**218/6**	**230/–**	,,
1 7/8"	**104/–**	**117/–**	**130/–**	**143/–**	**156/–**	**169/–**	**182/–**	**195/–**	**208/–**	**221/–**	**234/–**	**247/–**	**260/–**	,,
2"	**116/–**	**130/6**	**145/–**	**159/6**	**174/–**	**188/6**	**203/–**	**217/6**	**232/–**	**246/6**	**261/–**	**275/6**	**290/–**	,,

Left Hand Taps plus 33 1/3 %.

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ENGINEERS' HAND TAPS.

Fig. 24. BEST CAST STEEL TAPER MASTER TAPS FOR SCREWING MACHINES.

Whitworth Thread.

These Taps are made exact size over threads, also one depth of thread larger than standard diameter. The latter, for screwing or re-cutting Brown's or similar machine dies, are termed "Half-way Taps," and customers when ordering should clearly specify which sort of tap is required.

Diameter, inches ...	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$
Price each	**5/–**	**5/6**	**6/–**	**7/–**	**8/–**	**9/–**	**10/–**	**11/6**	**13/–**	**15/–**
Diameter, inches ...	$\frac{7}{8}$	$\frac{15}{16}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2
Price each	**17/–**	**19/6**	**22/–**	**28/–**	**34/–**	**40/–**	**48/–**	**58/–**	**68/–**	**82/–**	**96/–**

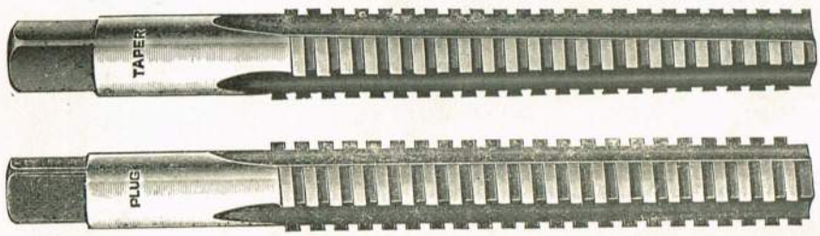

Fig. 25. Taper or Plug.

BEST CAST STEEL ENGINEERS' SQUARE THREAD TAPS.

These taps are made in 2, 3, or 4 taps, according to the depth of material to be tapped. Single start threads of pitches other than those listed can be supplied at regular prices. The above refer to taps having a single start thread. Taps having a thread of two or more starts are charged extra. Left-hand threads extra.

Diameter, inches ...	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Length overall, inches ...	5	$5\frac{1}{4}$	$5\frac{3}{4}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{4}$	9	$9\frac{3}{4}$	$10\frac{1}{2}$	$11\frac{1}{4}$
Threads per inch ...	9	8	7	6	5	5	4	4	$3\frac{1}{2}$	3
Price each	**14/6**	**16/9**	**20/–**	**26/9**	**35/9**	**44/6**	**53/6**	**62/6**	**72/6**	**82/6**

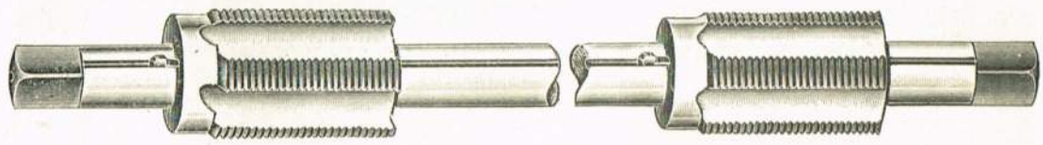

Fig. 26. BEST CAST STEEL STAY TAPS FOR MARINE BOILERS.

With holes keywayed for fitting on shafts.

When a Bar and 2 Taps complete are ordered, the necessary Keys are supplied without extra charge.

Diam.	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{3}{4}$	ins.
Length of tap													
$4\frac{1}{2}''$	**75/–**	**80/–**	**85/–**	**90/–**	**95/–**	**100/–**	**105/–**	**110/–**	**115/–**	**120/–**	**132/6**	**137/6**	each
$5''$	**80/–**	**85/–**	**90/–**	**95/–**	**100/–**	**105/–**	**110/–**	**115/–**	**120/–**	**132/6**	**137/6**	**145/–**	,,
$5\frac{1}{2}''$	**88/–**	**93/6**	**99/–**	**104/6**	**110/–**	**115/6**	**121/–**	**126/6**	**132/–**	**145/6**	**151/6**	**159/6**	,,
$6''$	**96/–**	**102/–**	**108/–**	**114/–**	**120/–**	**126/–**	**132/–**	**138/–**	**144/–**	**159/–**	**165/–**	**174/–**	,,
$7''$	**112/–**	**119/–**	**126/–**	**133/–**	**140/–**	**147/–**	**154/–**	**161/–**	**168/–**	**185/6**	**192/6**	**203/–**	,,
$8''$	**128/–**	**136/–**	**144/–**	**152/–**	**160/–**	**168/–**	**176/–**	**184/–**	**192/–**	**212/–**	**220/–**	**232/–**	,,
$9''$	**144/–**	**153/–**	**162/–**	**171/–**	**180/–**	**189/–**	**198/–**	**207/–**	**216/–**	**238/6**	**247/6**	**261/–**	,,
$10''$	**160/–**	**170/–**	**180/–**	**190/–**	**200/–**	**210/–**	**220/–**	**230/–**	**240/–**	**265/–**	**275/–**	**290/–**	,,

SHAFTS TO SUIT ABOVE squared on each end and keywayed full length.

8 to 12 feet long ×	$1\frac{3}{8}''$	$1\frac{1}{2}''$	$1\frac{5}{8}''$	$1\frac{3}{4}''$	$1\frac{7}{8}''$	$2''$ diameter
Price per foot	**7/6**	**7/6**	**8/6**	**9/6**	**10/6**	**11/6**

When the pitch of thread is not coarser than 11 threads per inch, it is usual to supply Tap B $\frac{1}{8}''$ larger than A. For coarser pitches the Taps advance $\frac{1}{4}''$.

Special quotations will be given for Stay Taps of dimensions varying from above.

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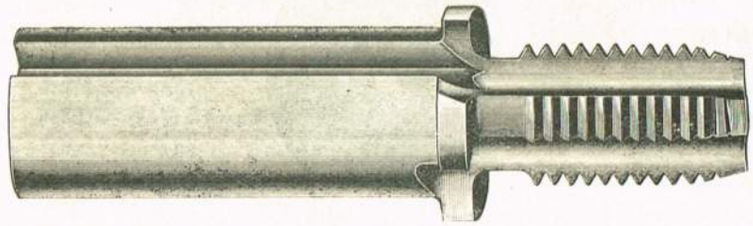
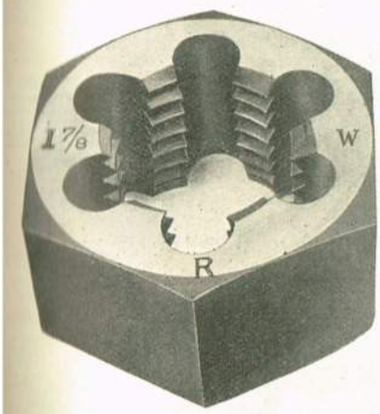
TAPS AND DIES.

Fig. 28. BEST CAST STEEL TAPS FOR PEARNS TAPPER.



	WHITWORTH THREAD.							GAS THREAD.									
Apparatus, Size A, inches	3/8	7/16"	1/2	9/16	5/8	3/4	...	1/8	1/4	3/8	1/2	5/8	3/4				
Price each	**8/9**	**9/–**	**9/6**	**10/–**	**10/6**	**11/9**	...	**9/6**	**11/3**	**13/–**	**14/9**	**16/6**	**18/3**				
Apparatus, Size B, inches	1/2	5/8	3/4	7/8	1	1 1/8	...	1/4	3/8	1/2	5/8	3/4	1	1 1/8	1 1/4	1 3/8	1 1/2
Price each ...	**11/3**	**11/9**	**13/–**	**15/6**	**17/3**	**19/–**	...	**14/6**	**15/6**	**18/3**	**19/–**	**20/6**	**25/–**	**30/–**	**35/–**	**40/–**	**46/–**
Apparatus, Size C	Prices on specification.																



"EXHIBITION" DIE NUTS. Finest Steel. Great Accuracy.

Fig. 29. Gas Threads.

Cutting, inches ...	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2
Price, each	**3/3**	**4/–**	**4/9**	**5/6**	**5/9**	**7/3**	**9/6**	**10/6**	**12/6**	**21/6**

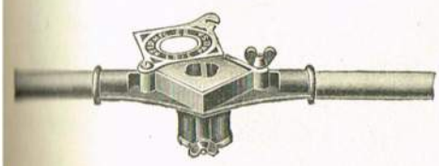
Fig. 30. Metric Threads.

Cutting, m/m. ...	3	5	6	8	10	11	12	14	
Price each	**2/6**	**2/6**	**2/6**	**2/9**	**3/–**	**3/3**	**3/6**	**4/–**	
Cutting, m/m.	16	18	20	22	24	30	33	36	39
Price each ...	**4/6**	**4/9**	**5/–**	**5/6**	**6/–**	**7/9**	**8/9**	**10/–**	**11/–**

When ordering, specify Catalogue No. corresponding with thread desired.

	Whitworth. Fig. 31.	**British Standard Fine.** Fig. 32.	**Cycle, Brass.** Fig. 33.	**Conduit.** Fig. 34.	**A.S.M.E.** Fig. 35.	**S.A.E.** Fig. 36.	**U.S.S.** Fig. 37.			
Cutting sizes, inches ...	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16
Price each	**2/6**	**2/6**	**2/6**	**2/9**	**3/–**	**3/3**	**3/6**	**4/–**	**4/6**	**4/9**
Cutting sizes, inches ...	3/4	13/16	7/8	15/16	1	1 1/8	1 1/4	1 3/8	1 1/2	
Price each	**5/–**	**5/3**	**5/6**	**5/9**	**6/–**	**7/9**	**8/9**	**10/–**	**11/–**	

Fig. 38. WALWORTH PATTERN STOCKS AND DIES FOR PIPES.



Sets consist of stock complete with guides, and assortment of dies as listed.
Stocks No. 2 SP and larger have lead screws.
Dies of the 3 SP and 4 SP sets have eight chasers.
Stock No. 4 has four arms instead of two.
All parts are interchangeable.
Stocks take the same sizes of standard dies of all other makes.

Set No.	Threading range inches	List price set	Extra dies each	Extra guides each	Set No.	Threading range inches	List price set	Extra dies each	Extra guides each
0 SP 1 ...	1/8 to 1/2 ...	**£1 13 4** ...	**5/10** ...	**1/3**	1 1/2 SP 5 ...	1/2 to 1 1/4 ...	**£2 7 11** ...	**8/4** ...	**2/6**
1 SP 1 ...	1/4 to 1 ...	**£2 3 9** ...	**6/8** ...	**1/8**	2 SP 1 ...	1 1/4 to 2 ...	**£3 0 5** ...	**10/5** ...	**3/2**
1 SP 2 ...	1/8 to 1 ...	**£2 10 0** ...	**6/8** ...	**1/8**	2 SP 2 ...	1 to 2 ...	**£3 10 10** ...	**10/5** ...	**3/2**
1 SP 3 ...	1/8 to 3/4 ...	**£2 3 9** ...	**6/8** ...	**1/8**	2 SP 3 ...	3/4 to 2 ...	**£4 1 3** ...	**10/5** ...	**3/2**
1 SP 4 ...	1/2 to 1 ...	**£1 11 3** ...	**6/8** ...	**1/8**	2 SP 4 ...	1/2 to 2 ...	**£4 11 8** ...	**10/5** ...	**3/2**
1 1/4 SP 1 ...	3/4 to 1 1/4 ...	**£1 19 7** ...	**8/4** ...	**2/6**	3 SP 1 ...	2 1/2 and 3 ...	**£7 5 10** ...	**37/6** ...	**8/4**
1 1/4 SP 3 ...	1/4 to 1 1/4 ...	**£3 4 7** ...	**8/4** ...	**2/6**	4 SP 1 ...	2 1/2 and 3 ...	**£8 15 0** ...	**37/6** ...	**8/4**

DIMENSIONS OF DIES. Inches.

Set No. ...	0 SP	1 SP	1 1/2 SP	2 SP	3 SP	4 SP
Sizes... ...	2×2×1/2	2 1/2×2 1/2×3/4	3×3×3/4	4×4×7/8	5×5×1 1/4	5×5×1 1/2

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DIES CIRCULAR.

Fig. 39. WHITWORTH.
Fig. 40. B.S.F.
Fig. 41. CYCLE.
Fig. 42. BRASS.

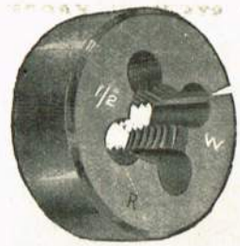


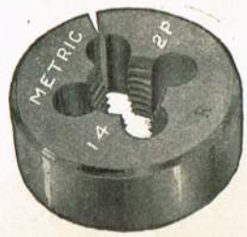
Fig. 43. CONDUIT.
Fig. 44. A.S.M.E.
Fig. 45. S.A.E.
Fig. 46. U.S.S.

The Prices shewn are for any of the above at corresponding cutting sizes.

Cutting size inches	1/16	3/32	1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2	9/16	5/8
Outside diameter 5/8"	**3/–**	**3/–**	**2/6**	**2/6**	**2/6**	**2/6**	—	—	—	—	—	—	—	—	—
,, ,, 13/16"	**3/6**	**2/9**	**2/3**	**2/3**	**2/3**	**2/3**	**2/3**	—	—	—	—	—	—	—	—
,, ,, 1"	**5/6**	**5/6**	**2/9**	**2/9**	**2/9**	**2/9**	**2/9**	**2/9**	**2/9**	**3/–**	**3/–**	—	—	—	—
,, ,, 1 5/16"	—	—	—	—	—	—	**4/–**	**4/–**	**4/–**	**4/–**	....**4/–**	**4/6**	**4/6**	—	—
,, ,, 1½"	—	—	—	—	—	—	**5/–**	**5/–**	**5/–**	**5/–**	**5/–**	**5/6**	**5/6**	**5/6**	**5/6**

Cutting size, inches	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1	1⅛	1¼	1⅜	
Outside diameter 1¾"	**6/–**	**6/–**	**6/–**	**6/6**	**6/6**	**7/–**	**7/–**	—	—	—	—	—	—	—	—
,, ,, 2"	**7/6**	**7/6**	**7/6**	**7/6**	**7/6**	**8/–**	**8/–**	**8/6**	**8/6**	—	—	—	—	—	—
,, ,, 2¼"	—	—	**9/–**	**9/–**	**9/–**	**9/6**	**9/6**	**9/6**	**9/6**	**10/6**	**10/6**	**10/6**	**10/6**	**10/6**	**10/6**

CIRCULAR DIES.



METRIC (S1). Fig. 47.

Outside diameter, 13/16". Cutting 3, 4, 5, 6 m/m. **2/3** each.
,, ,, 1". ,, ,, 3, 4, 5, 6, 7, 8, m/m. **2/9** each. Cutting 9, 10 m/m, **3/–** each.
,, ,, 1 5/16". ,, 6, 8, 9 m/m. **4/–** each. Cutting 11, 12 m/m, **4/6** each.
,, ,, 1½". ,, ,, 6, 8, 9 m/m. **5/–** each. Cutting 11, 12, 14, 16 m/m, **5/6** each.
,, ,, 1¾". ,, ,, 9, 11, 12 m/m. **6/–** each. Cutting 14, 16 m/m, **6/6** each. Cutting 18 m/m. **7/–** each.
,, ,, 2". ,, ,, 9, 11, 12, 14, 16 m/m, **7/6** each. Cutting 18 m/m, **8/–** each. Cutting 20, 22 m/m, **8/6** each.
,, ,, 2¼". ,, ,, 12, 14, 16 m/m, **9/–** each. Cutting 18, 20, 22 m/m, **9/6** each. Cutting 24, 27, 30, 33 m/m, **10/6** each.

Dies larger than 2¼" outside diameter can be quoted for.

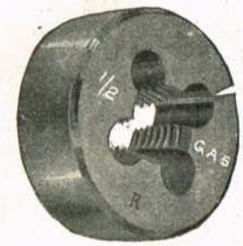
Fig. 48. BEST WARRANTED CIRCULAR DIES. SPLIT.
BRITISH ASSOCIATION.

No.	0	1	2	3	4	5	6	7	8	9	10	11	12
Price 5/8" diam.	**2/–**	**2/–**	**2/–**	**2/–**	**2/–**	**2/–**	**2/–**	**2/–**	**2/–**	**3/–**	**3/–**	**4/6**	**4/6**
,, 13/16" diam.	**2/3**	**2/3**	**2/3**	**2/3**	**2/3**	**2/3**	**2/3**	**2/3**	**2/3**	**3/6**	**3/6**	**5/6**	**5/6**
,, 1" diam.	**2/9**	**2/9**	**2/9**	**2/9**	**2/9**	**2/9**	**2/9**	**2/9**	**2/9**	**4/–**	**4/–**	**6/–**	**6/–**

Fig. 49. BEST WARRANTED CIRCULAR DIES. SOLID. BRITISH ASSOCIATION.

No.	0	1	2	3	4	5	6	7	8	9	10	11	12
Price, 5/8" diam.	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**3/6**	**3/6**	—	—
13/16" diam.....	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**3/6**	**3/6**	—	—
1" diam.	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**3/6**	**3/6**	—	—

Fig. 50. CIRCULAR SPLIT DIES CUTTING GAS THREADS.



Outside diameter, 1". Cutting ⅛", **3/–** each.
,, ,, 1 5/16". ,, ⅛", **4/–** each. Cutting ¼", ⅜", **4/6** each.
,, ,, 1½". ,, ⅛", **5/–** each. ,, ¼", ⅜", ½", **5/6** each.
,, ,, 2". ,, ⅛", ¼", ⅜", **7/6** each. Cutting ½", ⅝", ¾", **10/6** each.
,, ,, 2¼". ,, ⅛", ¼", ⅜", **9/6** each. ,, ½", ⅝", ¾", **12/–** each.
Cutting ⅞", 1", **12/6** each.

Split Gas Thread Dies larger than 1" cutting size can be quoted for.

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DIE NUTS, ETC.

BEST CAST STEEL HEXAGON DIE NUTS.

FIG. 57. Whitworth's Standard Threads.

For standardising bolts, and for re-screwing the damaged or burred threads of studs and bolts.

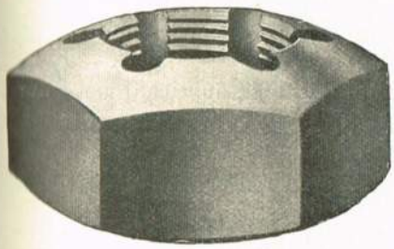
This improved Die Nut is much strengthened as the following dimensions shew. The notches give ample clearance, the threads are well relieved, so that the tools may be used for screwing a new thread where stocks and dies cannot be put to work.

Bolt size	ins.	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
Across flats	ins.	19/32	11/16	13/16	15/16	1 3/32	1 1/4	1 1/2	1 11/16	1 7/8
Price each	....	**5/–**	**5/–**	**5/–**	**6/–**	**7/–**	**8/–**	**10/–**	**12/–**	**14/6**

Bolt size	ins.	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
Across flats	ins.	2 1/16	2 1/4	2 7/16	2 5/8	2 3/4	3	3 3/16	3 11/32
Price each	....	**17/–**	**20/–**	**24/–**	**28/–**	**33/–**	**38/–**	**44/–**	**50/–**

FIG. 52. Boiler Stay Die Nuts.

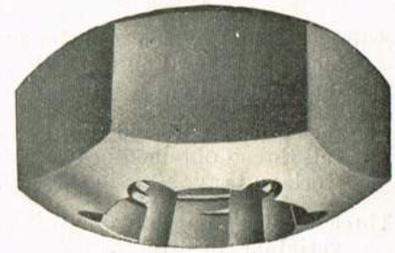
Top view.



With rounded faces. Very strong, for hard service. Customers should state on order the number of threads per inch required.

Diameter	ins.	3/4	13/16	7/8	15/16	1	1 1/16
Across flats	ins.	1 11/16	1 7/8	1 7/8	2 1/16	2 1/16	2 1/4
Price each		**12/–**	**13/–**	**14/–**	**15/6**	**17/–**	**18/6**
Diameter	ins.	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8	1 7/16
Across flats	ins.	2 1/4	2 7/16	2 7/16	2 5/8	2 5/8	2 3/4
Price each		**20/–**	**22/–**	**24/–**	**26/–**	**28/–**	**30/6**
Diameter	ins.	1 1/2	1 5/8	1 3/4	1 7/8	2	
Across flats	ins.	2 3/4	3	3 3/16	3 11/16	3 1/2	
Price each		**33/–**	**38/–**	**44/–**	**50/–**	**56/–**	

Bottom view.



Top view. With Guide.

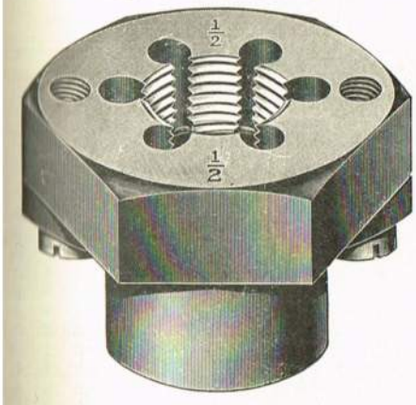


FIG. 53. Gas Die Nuts.

With and without Guides.
Screw at full thread once over.
Can be worked with an ordinary nut spanner.

Pipe size	ins.	1/8	1/4	3/8	1/2	5/8	3/4
Across flats	ins.	1 1/2	1 1/2	1 11/16	1 7/8	2 1/16	2 3/8
Thickness	ins.	7/16	7/16	7/16	7/16	1/2	9/16
Price of die		**6/–**	**6/6**	**7/–**	**7/6**	**9/–**	**10/–**
Extra with guide		**2/6**	**2/6**	**2/6**	**3/6**	**4/–**	**4/–**

Pipe size	ins.	1	1 1/4	1 1/2	1 3/4	2
Across flats	ins.	2 3/4	3 1/8	3 9/16	3 7/8	4 3/16
Thickness	ins.	5/8	11/16	3/4	13/16	7/8
Price of die		**13/6**	**20/–**	**26/–**	**34/–**	**34/–**
Extra with guide		**5/–**	**7/–**	**10/–**	**13/–**	**13/–**

Left Hand Die Nuts plus 33⅓%.

Bottom view. Die without guide.

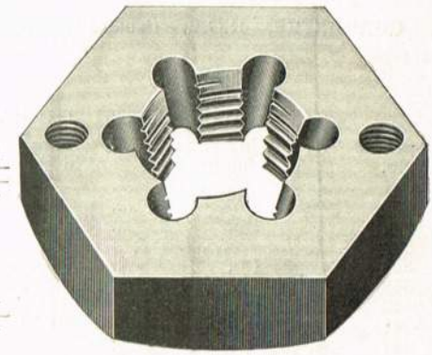
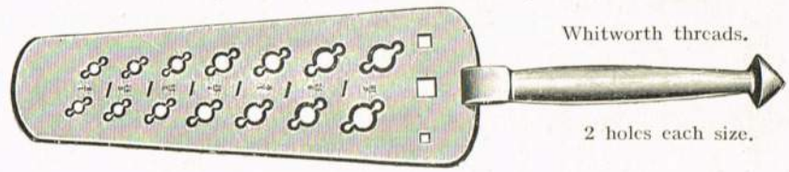


FIG 54. Engineers' Screw Plate and Tap Wrench combined.



Whitworth threads.

2 holes each size.

	No. 1. 7 sizes.	No. 2. 7 sizes
To screw	1/16 to 1/4 × 1/32	1/8 to 5/16 × 1/32
With one black tap each size	**25/6**	**32/6**
With chased and fluted taps.		
Taper each size	**35/–**	**38/–**
Taper and plug each size	**49/-**	**52/-**

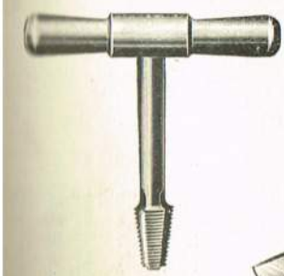


Fig. 55.
Burner Tap & Handle.
Price **4/3** each.

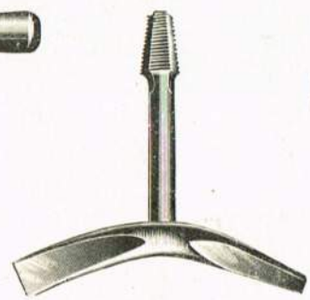


Fig. 56.
Burner Tap with Rimer and Turnscrew.
Price **4/9** each.

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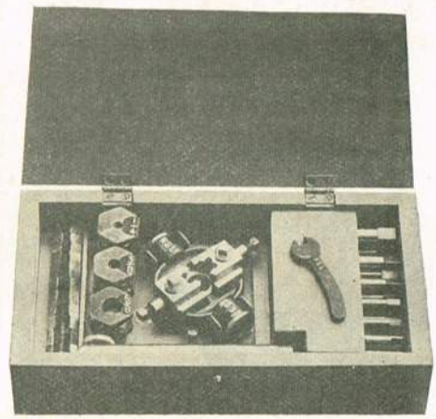
STOCKS AND DIES.

British Manufacture throughout.

FIG. 57. R.G.L.



ADJUSTABLE DIES are generally made in two or more pieces and possess the advantage that oversize material can be more readily dealt with, and the size of finished work adapted to meet variations in fittings. The disadvantages must frequently found are: either adjustments take some time to make, or the dies are not held firmly enough to ensure easy starting and true threads.

These Stocks and Dies are claimed to have the following advantages:

Adjustable dies which can be instantly adjusted and locked into position when they form practically solid dies and will cut a full thread at once over.

The dies can be adjusted to take oversize material and a full thread obtained in two cuts, which will be easier work and save time in the end.

Threads can be cut above and below normal size to suit variations in fittings.

Dies can be easily sharpened and kept in good cutting order.

Visible cutting, the operator can see exactly how the dies are working.

Owing to the formation of the stock, lubricant is retained at the cutting edges.

Ample bearing surfaces for dies.

Guide bushes are provided which eliminate all possibility of drunken threads.

Chips cannot jamb in the guide bush.

Specially suitable for export, as sets pack up into a small space.

GUARANTEE.—R.G.L. Usual 12 months against defects in material or workmanship, or any special guarantee (within reason) which the purchaser may desire.

PRICES.

WHITWORTH THREAD.

Set No.	Cutting sizes in inches	Taps in set	Tap wrenches	Price per set
551	¼, ⅜, ½, and ⅝	—	—	**£1 18 0**
552	Do.	4	—	**2 6 0**
5524	Do.	8	—	**2 14 0**
553	¼, 5/16, ⅜, 7/16, ½, ⅝ & ¾	—	—	**2 16 0**
554	Do.	7	—	**3 12 0**
559	Do.	14	—	**4 8 0**
5510	Do.	14	2	**5 2 0**
5511	Do.	21	2	**6 2 0**
441	½, ⅝, ¾, ⅞ and 1	—	—	**2 15 0**
442	Do.	5	—	**3 13 0**
4424	Do.	10	—	**4 11 0**
4425	Do.	10	1	**4 19 0**
4453	¼, ⅜, ½, ⅝, ¾, ⅞ and 1	—	—	**3 19 0**
4454	Do.	7	—	**4 19 0**
4459	Do.	14	—	**5 19 0**
4560	Do.	14	2	**6 12 0**

GAS THREAD.

Set No.	Cutting sizes in inches	Taps in set	Tap wrenches	Price per set
557	⅛, ¼, ⅜ and ½	—	—	**£1 18 0**
558	Do.	4	—	**2 8 0**
5512	Do.	8	—	**2 18 0**
5513	Do.	8	1	**3 6 6**
447	¼, ⅜, ½, ¾ and 1	—	—	**2 15 0**
448	Do.	5	—	**3 17 0**
4412	Do.	10	—	**4 19 0**
4413	Do.	10	2	**5 15 0**
335	1¼, 1½ and 2	—	—	**3 12 0**
336	Do.	3	—	**5 2 0**
337	1, 1¼, 1½ and 2	—	—	**4 5 0**
338	Do.			**6 2 0**

B.S.F., BRASS AND CRCLE THREAD SETS also supplied.

CONDUIT THREAD.

Set No.	Cutting sizes in inches	Taps in set	Tap wrenches	Price per set
555	½, ⅝, and ¾	—	—	**£1 12 0**
556	Do.	3	—	**2 1 0**
5514	Do.	3	1	**2 9 0**
5520	½, ⅝, ¾, ⅞ and 1	—	—	**2 6 0**
5521	Do.	5	—	**3 5 0**
5526	Do.	5	1	**3 15 6**
445	⅞, 1 and 1¼	—	—	**2 2 0**
446	Do.	3	—	**3 1 0**
4426	Do.	3	1	**3 11 6**
4420	½, ⅝, ¾, 1 and 1¼	—	—	**2 15 0**
4421	Do.	5	—	**3 17 0**
4427	Do.	5	1	**4 7 6**
331	1½ and 2	—	—	**2 18 0**
332	1¼, 1½ and 2	—	—	**3 12 0**

STOCKS can be supplied separate from the Sets at the following prices:

Stock No.	Maximum capacity	Price
55	¾″ Whitworth	**£0 18 6**
	½″ Gas	**0 18 6**
	1″ Conduit	**0 18 6**
44	1″ Whitworth	**1 5 0**
	1″ Gas	**1 5 0**
	1¼″ Conduit	**1 5 0**
33	2″ Gas	**2 2 0**
	2″ Conduit	**2 2 0**

Prices include 1 pair of Dies and Guide Bush.

PRICES OF DIES AND BUSHES.

Nos.	55	F4	33
Dies ...	**5/8**	**7/–**	**12/–**
Bushes	**1/–**	**1/3**	**2/–**

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SOLID DIE STOCKS.

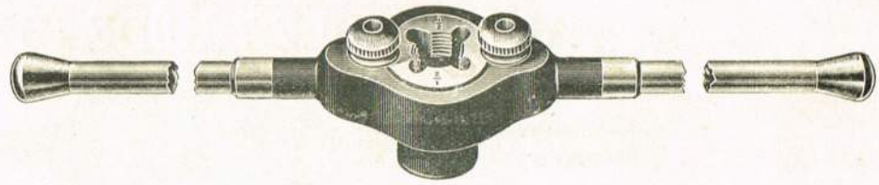
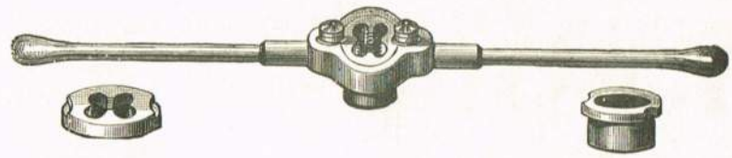


Fig. 58. For Screwing Iron Gas Pipes at once over.

	To Screw	Price without taps. £ s. d.	Price with taper and plug taps £ s. d.	Price extra dies.	Price extra guides.
A	¼″ ⅜″	1 17 0	2 7 9	7/–	2/6
	¼″ ¼″ ⅜″	2 6 6	3 2 0		
B	½″	2 0 6	2 8 0	8/6	3/6
	½″ ½″	2 12 6	3 5 6		
	½″ ¾″ ½″	3 4 6	4 2 6		
	½″ ½″ ⅜″ ½″	3 16 6	4 19 0		
C	¾″	2 16 6	3 8 6	10/6	4/–
	½″ ¾″	3 11 0	4 10 6		
	¾″ ½″ ¾″	4 5 6	5 10 6		
	½″ ⅝″ ¾″	4 5 6	5 15 6		
	¼″ ⅜″ ½″ ¾″	5 0 0	6 10 0		
	½″ ¾″ ½″ ⅝″ ¾″	5 14 6	7 15 0		
D	1″	3 11 6	4 7 6	13/6	5/–
	¾″ 1″	4 10 0	5 18 0		
	½″ ¾″ 1″	5 8 6	7 4 0		
	¾″ ½″ ¾″ 1″	6 7 0	8 8 0		
	½″ ⅝″ ¾″ 1″	6 7 0	8 13 0		
	¼″ ¾″ ½″ ¾″ 1″	7 5 6	9 11 6		
E	1¼″	4 11 0	5 17 0	20/–	7/–
	1″ 1¼″	5 18 0	8 0 0		
	¾″ 1″ 1¼″	7 5 0	9 19 0		
	½″ ¾″ 1″ 1¼″	8 12 0	11 13 0		
	¾″ ½″ ¾″ 1″ 1¼″	9 19 0	13 6 0		
F	1½″	5 13 0	7 11 0	26/–	10/–
	1¼″ 1½″	7 9 0	11 13 0		
	1″ 1¼″ 1½″	9 5 0	13 5 0		
	¾″ 1″ 1¼″ 1½″	11 1 0	15 13 0		
	½″ ¾″ 1″ 1¼″ 1½″	12 17 0	17 16 6		

	To Screw	Price without taps. £ s. d.	Price with taper and plug taps £ s. d.	Price extra dies.	Price extra guides.
G	1¾″	6 11 0	9 5 0	34/–	13/–
	1½″ 1¾″	8 18 0	13 10 0		
	1¼″ 1½″ 1¾″	11 5 0	17 3 0		
	1″ 1¼″ 1½″ 1¾″	13 12 0	20 6 0		
	2″	6 11 0	10 5 0		
	1½″ 2″	8 18 0	14 10 0		
	1¼″ 1½″ 2″	11 5 0	18 3 0		
	1½″ 1¾″ 2″	11 5 0	19 11 0		
	1″ 1¼″ 1½″ 2″	13 12 0	21 6 0		
	1¼″ 1½″ 1¾″ 2″	13 12 0	23 4 0		
	1″ 1¼″ 1½″ 1¾″ 2″	15 19 0	26 7 0		
H	2¼″	8 9 0	13 3 0	47/–	16/–
	2″ 2¼″	11 12 0	19 0 0		
	1½″ 2″ 2¼″	14 15 0	25 1 0		
	1½″ 1¾″ 2″ 2¼″	17 18 0	30 18 0		
J	2½″	8 9 0	14 9 0	47/–	16/–
	2¼″ 2½″	11 12 0	22 6 0		
	1½″ 2″ 2½″	14 15 0	26 7 0		
	2″ 2¼″ 2½″	14 15 0	29 3 0		
	1½″ 2″ 2¼″ 2½″	17 18 0	34 4 0		
K	3	10 0 0	19 4 0	60/–	21/–
	2½″ 3″	14 1 0	29 5 0		
	2″ 2½″ 3″	18 2 0	37 0 0		
	2½″ 2¾″ 3″	18 2 0	40 18 0		
	2″ 2¼″ 2½″ 3″	22 3 0	45 15 0		
	2¼″ 2½″ 2¾″ 3″	22 3 0	49 13 0		

Fig. 59. Solid Die Stocks for Screwing Electrical Conduit Pipes.



Stock.	To screw, Outside diam. of tube.	Without taps.	With taper and plug taps.	Dies each.	Guides each.
BC	¾″	2 0 6	2 9 2	8/6	3/6
	⅝″ ¾″	2 12 6	3 8 2		
	½″ ⅝″ ¾″	3 4 6	4 5 6		
CC	1″	2 16 6	3 9 2	10/6	4/–
	¾″ 1″	3 11 0	4 12 4		
	⅝″ ¾″ 1″	4 5 6	5 13 10		

Price of taps	½″	⅝″	¾″	⅞″	1″	1¼	1½″	1¾″	2″
Taper or plug	2/8	3/6	4/4	5/4	6/4	9/–	13/6	18/6	23/6

Stock.	To screw, Outside diam. of tube.	Without taps.	With taper and plug taps.	Dies each.	Guides each.
DC	1¼″	3 11 6	4 9 6	13/6	5/–
	1″ 1¼″	4 10 0	6 0 8		
	⅞″ 1″ 1¼″	5 8 6	7 9 10		
EC	1½″	4 11 0	5 18 0	20/–	7/–
	1¼″ 1½″	5 18 0	8 3 0		
	1″, 1¼″ 1½″	7 5 0	10 2 8		
FC	2″	5 13 0	8 0 0	26/–	10/–
	1¼″ 2″	7 9 0	11 3 0		
	1¼″ 1½″ 2″	9 5 0	13 17 0		

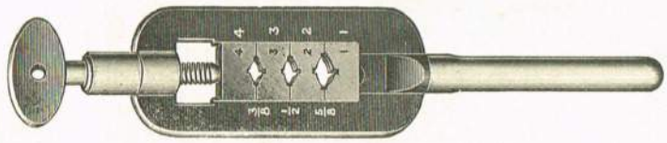


Fig. 60. Best Quality Stocks and Dies for Brass and Copper Tubes.
26 threads per inch.

	To screw.	Without taps. £ s. d.	With taper and plug taps. £ s. d.
¼″ Iron.	⅜″ ½″ Brass	1 7 0	2 1 6
⅜″	⅜″ ½″ Brass	1 7 0	2 1 6
½″	½″ ½″	1 9 6	2 8 0
½″	½″	1 10 0	2 6 0
¾″	½″ ⅝″	1 12 6	2 13 0
¾″	¾″ ½″ ⅝″	1 15 0	3 0 0
1″	1″	1 15 6	2 13 6
1″	⅝″ ¾″	1 19 0	3 2 0

	To screw.	Without taps. £ s. d.	With taper and plug taps. £ s. d.
	¼″ ⅜″ ½″ ⅝″ ¾″	2 4 0	3 11 0
	⅝″ ¾″ ⅞″	2 2 0	3 4 0
	¾″ ⅞″ 1″	2 4 0	3 11 0
	⅝″ ¾″ ⅞″ 1″	2 8 0	4 1 0
	¾″ 1″ 1¼″	2 18 0	4 11 6
	⅝″ ¾″ 1″ 1¼″	3 6 0	5 5 6
	1″ 1¼″ 1½″	4 5 0	6 10 0
	¾″ 1″ 1¼″ 1½″	5 4 0	7 16 0
	1″ 1¼″ 1½″ 2″	7 5 0	11 3 0

Fig. 61. Taper and Plug Taps for Brass. All sizes ⅝″ and up have standard Tap Squares.

⅛″	¼″	⅜″	½″	⅝″	¾″	⅞″	1″	1⅛″	1¼″	1½″	1¾″	2″
2/2	2/2	2/4	2/8	3/–	3/4	4/8	5/4	6/8	8/–	9/4	14/–	18/– each

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ADJUSTABLE GUIDE STOCKS.

Hinge Pattern.

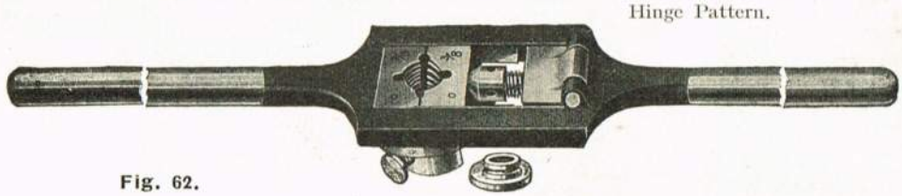


Fig. 62.

Hinged pattern for gas thread. Will be found superior to the ordinary solid die stock for screwing a full thread at once over. Is capable of being adjusted $^1/_{16}''$.

To screw inches	Without taps £ s. d.	With taper and plug taps £ s. d	Extra dies per pair	Extra guides each
⅛, ¼, ⅜	2 14 6	3 10 2	5/–	2/6
¼, ⅜, ½	4 6 0	5 5 0	8/–	3/6
⅛, ¼, ⅜, ½	4 17 6	6 1 2		
⅜, ½, ¾	5 15 0	6 1 0	10/–	4/–
¼, ⅜, ½, ¾	6 9 0	8 0 0		
½, ¾, 1	7 14 0	8 10 0	14/–	5/–
⅜, ½, ¾, 1	8 13 0	10 15 0		
¾, 1, 1¼	9 15 0	12 9 0	17/–	7/–

To screw inches	Without taps £ s. d.	With taper and plug taps £ s. d.	Extra dies per pair	Extra guides each
½, ¾, 1, 1¼	10 19 0	14 1 0		
1, 1¼, 1½	12 9 0	16 9 0	27/–	10/–
¾, 1, 1¼, 1½	14 6 0	18 18 0		
1¼, 1½, 2	15 4 0	22 2 0	32/–	13/–
1, 1¼, 1½, 2	17 9 0	25 3 0		
2, 2¼, 2½	19 17 6	34 5 6	40/–	16/–
1½, 2, 2¼, 2½	22 13 6	38 19 6		
2¼, 2½, 3	24 8 0	44 6 0	48/–	21/–

Fig. 63. Double-Action Ratchet Screwing Stocks.

For British standard iron pipe a full thread at once over.

The action is reversed by a slight movement of the tommie-holed pin as shewn in above illustration.

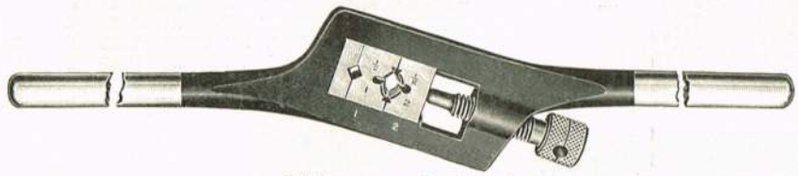
To screw Inches	Complete with dies & guides per set £ s. d.	Extra Dies each	Extra Guides each
½	5 12 6		
⅜, ½	6 4 6	8/6	3/6
¼, ⅜, ½	6 16 6		
1	7 9 0		
¾, 1	8 7 6	13/6	5/–
½, ¾, 1	9 6 0		

To screw Inches	Complete with dies & guides per set £ s. d.	Extra Dies each	Extra Guides each
1¼	8 17 0		
1, 1¼	10 4 0	20/–	7/–
¾, 1, 1¼	11 11 0		
1½	10 2 6		
1¼, 1½....	11 18 6	26/–	10/–
1, 1¼, 1½	13 14 6		

To screw Inches	Complete with dies & guides per set £ s. d.	Extra Dies each	Extra Guides each
2	12 12 6		
1½, 2	14 19 6	34/–	13/–
1¼, 1½, 2	17 6 6		
2½	16 10 0		
2¼, 2½	19 13 0	47/–	16/–
2, 2¼, 2½	22 16 0		
3	20 12 0		
2½, 3	24 13 0		
2¼, 2½, 3	28 14 0		
4	29 0 0		
3½, 4	34 5 0		
3, 3½, 4	39 10 0		

Fig. 64. IMPROVED PATTERN ANGULAR STOCKS AND DIES.

The Screwing Dies serve the purpose of an adjustable tap and reamer



Whitworth standard. The feed screw in the stock has the head milled so that easy adjustment is attained by finger and thumb.

With cases and without.

To screw Inches	Set	With taper and plug taps to each size £ s. d.	With taper Second and plug taps to each size £ s. d.	Including Tommy, and fitted into Polished case per set extra £ s. d.
⅛, 3/16, ¼	A	2 3 6	2 10 6	0 15 0
1/16, ⅛, 3/16, ¼	B	2 12 0	3 1 0	0 15 0
⅛, 3/16, ¼, 5/16	C	2 13 0	3 2 6	0 15 0
¼, 5/16, ⅜	D	2 4 0	2 10 6	0 15 0
3/16, ¼, 5/16, ⅜	E	2 13 0	3 2 6	0 15 0
⅛, 3/16, ¼, 5/16, ⅜	F	3 1 6	3 11 6	0 15 0
¼, ⅜, ½	G	2 12 6	3 0 0	1 0 0
¼, 5/16, ⅜, ½	H	3 2 0	3 11 0	1 0 0
¼, 5/16, ⅜, 7/16, ½	I	3 12 0	4 4 0	1 0 0
⅜, ½, ⅝	J	3 6 0	3 15 0	1 5 0
¼, ⅜, ½, ⅝	K	3 16 0	4 7 6	1 5 0
¼, 5/16, ⅜, 7/16, ½, ⅝	L	4 18 6	5 14 6	1 5 0
⅛, 3/16, ¼, 5/16, ⅜, 7/16, ½, ⅝	M	6 9 6	7 11 0	1 12 6

To screw Inches	Set	With taper and plug taps to each size £ s. d.	With taper Second and plug taps to each size £ s. d.	Including Tommy, and fitted into Polished case per set extra £ s. d.
½, ⅜, ¾	N	4 1 0	4 13 0	1 12 6
⅜, ½, ⅝, ¾	O	4 14 0	5 8 0	1 12 6
¼, ⅜, ½, ⅝, ¾	P	5 6 0	6 2 0	1 12 6
⅜, 7/16, ½, ⅝, ¾	Q	5 7 0	6 4 0	1 12 6
⅛, 3/16, ¼, 5/16, ⅜, 7/16, ½, ⅝, ¾	R	8 0 0	9 6 6	2 0 0
⅝, ¾, ⅞	S	5 6 0	6 1 6	1 16 0
½, ⅝, ¾, ⅞	T	6 2 0	7 1 0	1 16 0
¾, ⅞, 1	U	5 14 0	6 13 6	1 16 0
⅝, ¾, ⅞, 1	V	6 12 0	7 15 6	1 16 0
½, ⅝, ¾, ⅞, 1	W	7 8 0	8 14 6	1 16 0
¼, 5/16, ⅜, 7/16, ½, ⅝, ¾, ⅞, 1	X	10 4 0	12 0 0	2 5 0

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WHITWORTH PATTERN GUIDE STOCKS AND DIES.

Finest material. Whitworth Standard Thread. Complete with Tap Wrenches and Nut Keys, in **Wood Case.**

As supplied to Home, Colonial and Foreign Governments, Municipal Authorities, Shipyards, and the largest Engineering Workshops in the Kingdom.

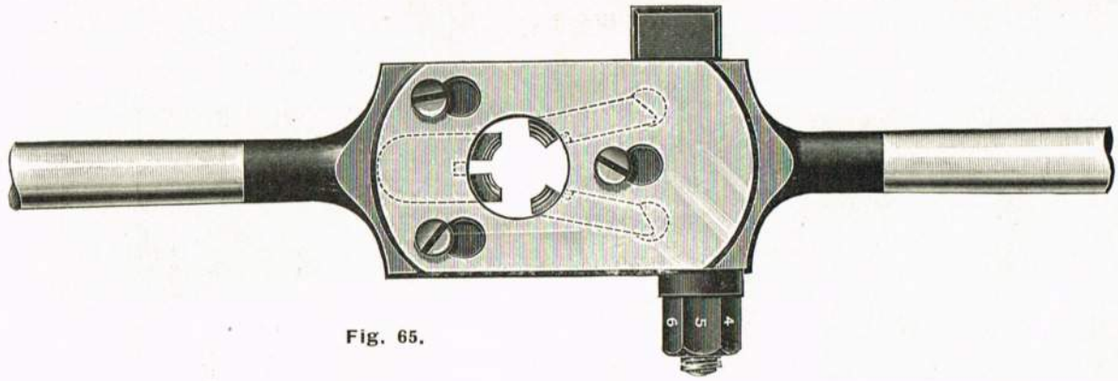

Fig. 65.

Set.	To screw.	With taper and plug taps. £ s. d.	With taper Second and plug taps. £ s. d.
A	3/8" 1/2" 5/8" 3/4" 7/8" 1"	**22 5 0**	**24 5 0**
B	1/4" 3/8" 1/2" 5/8" 3/4" 7/8" 1"	**23 2 6**	**25 5 0**
C	1/4" 5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1"	**25 0 0**	**27 6 0**
E	1/4" 3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4"	**31 10 0**	**34 10 0**
F	1/4" 5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4"	**36 16 6**	**40 0 0**
H	1/4" 3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2"....	**46 5 0**	**51 10 0**
I	1/4" 5/16 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2"	**48 0 0**	**53 10 0**
L	1/4" 5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2" 1 5/8" 1 3/4" 1 7/8" 2" in two cases	**91 5 0**	**104 10 0**

Fig. 66. WHITWORTH PATTERN GUIDE STOCKS AND DIES, WITHOUT CASES.

To screw.	Without taps. £ s. d.	With taper and plug taps. £ s. d.	With taper second and plug taps. £ s. d.	Dies per set.
1/4" 5/16" 3/8"	**4 14 0**	**5 6 0**	**5 13 0**	**10/-**
3/16" 1/4" 5/16" 3/8"	**5 4 0**	**6 0 8**	**6 9 0**	
1/4" 5/16" 3/8" 7/16"	**5 10 0**	**6 8 0**	**6 17 0**	**11/-**
1/4" 3/8" 1/2"	**5 6 0**	**6 0 8**	**6 8 0**	**12/-**
3/8" 7/16" 1/2"	**5 6 0**	**6 2 0**	**6 10 0**	
5/16" 3/8" 7/16" 1/2"	**5 18 0**	**6 18 0**	**7 8 0**	
1/4" 5/16" 3/8" 7/16" 1/2"	**6 10 0**	**7 14 0**	**8 6 0**	
3/8" 1/2" 5/8"....	**6 0 0**	**6 18 8**	**7 8 0**	**13/6**
3/8" 7/16" 1/2" 5/8"	**6 13 6**	**7 17 6**	**8 9 6**	
1/4" 3/8" 1/2" 5/8"	**6 13 6**	**7 16 2**	**8 7 6**	
1/4" 5/16" 3/8" 1/2" 5/8"	**7 7 0**	**8 13 8**	**9 7 0**	
1/8" 5/8" 3/4"	**6 15 0**	**7 19 0**	**8 11 0**	**15/-**
3/8" 1/2" 5/8" 3/4"	**7 10 0**	**8 18 8**	**9 13 0**	
3/8" 7/16" 1/2" 5/8" 3/4"	**8 5 0**	**9 19 0**	**10 16 0**	
3/8" 3/4" 7/8"	**8 15 0**	**10 6 0**	**11 1 6**	**17/-**
1/8" 5/8" 3/4" 7/8"	**9 12 0**	**11 9 0**	**12 7 6**	
3/8" 1/2" 5/8" 3/4" 7/8"	**10 9 0**	**12 10 8**	**13 11 6**	
3/8" 3/4" 1"	**8 15 0**	**10 9 0**	**11 6 0**	**17/-**
1/2" 7/8" 1"	**8 15 0**	**10 14 0**	**11 13 6**	
3/8" 3/4" 7/8" 1"	**9 12 0**	**11 19 0**	**13 2 6**	
1/8" 5/8" 3/4" 7/8" 1"	**10 9 0**	**13 2 0**	**14 8 6**	
7/8" 1" 1 1/8"	**10 10 0**	**12 19 0**	**14 3 6**	**20/-**
3/4" 7/8" 1" 1 1/8"	**11 10 0**	**14 9 0**	**15 18 6**	
5/8" 3/4" 7/8" 1" 1 1/8"	**12 10 0**	**15 17 0**	**17 10 6**	
3/4" 1" 1 1/4"	**10 10 0**	**13 2 0**	**14 8 0**	**20/-**
1" 1 1/8" 1 1/4"	**10 10 0**	**13 12 0**	**15 3 0**	
7/8" 1" 1 1/8" 1 1/4"	**11 10 0**	**15 5 0**	**17 2 6**	
3/4" 7/8" 1" 1 1/8" 1 1/4"	**12 10 0**	**16 15 0**	**18 17 6**	
1" 1 1/4" 1 1/2"	**12 2 0**	**16 6 0**	**18 8 0**	**24/-**
1 1/4" 1 3/8" 1 1/2"	**12 2 0**	**17 4 0**	**19 15 0**	
1" 1 1/8" 1 1/4" 1 1/2"	**13 6 0**	**18 10 0**	**21 2 0**	
1 1/8" 1 1/4" 1 3/8" 1 1/2"	**13 6 0**	**19 8 0**	**22 9 0**	
1" 1 1/8" 1 1/4" 1 3/8" 1 1/2"	**14 10 0**	**21 8 0**	**24 17 0**	
1 1/4" 1 1/2" 1 3/4"	**15 10 0**	**22 2 0**	**25 8 0**	**30/-**
1 1/2" 1 5/8" 1 3/4"	**15 10 0**	**23 8 0**	**27 7 0**	
1" 1 1/4" 1 1/2" 1 3/4"	**17 0 0**	**24 8 0**	**28 2 0**	
1 3/8" 1 1/2" 1 5/8" 1 3/4"	**17 10 0**	**27 2 0**	**31 18 0**	
1 1/4" 1 3/8" 1 1/2" 1 5/8" 1 3/4"	**19 0 0**	**29 18 0**	**35 7 0**	
1 1/2" 1 3/4" 2"	**17 10 0**	**27 10 0**	**32 10 0**	**30/-**
1 3/4" 1 7/8" 2"	**17 10 0**	**29 6 0**	**35 4 0**	
1 1/4" 1 1/2" 1 3/4" 2"	**19 0 0**	**30 6 0**	**35 10 0**	
1 5/8" 1 3/4" 1 7/8" 2"	**19 0 0**	**33 8 0**	**40 12 0**	
1 1/2" 1 5/8" 1 3/4" 1 7/8" 2"	**20 10 0**	**37 0 0**	**45 5 0**	

ALL THE STOCKS AND DIES LISTED ARE OF FIRST-CLASS MANUFACTURE, AND ARE FULLY GUARANTEED.

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TAPS AND DIES
IN
SOLID OAK
CASES

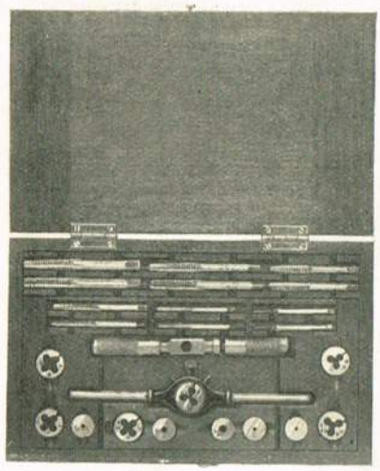
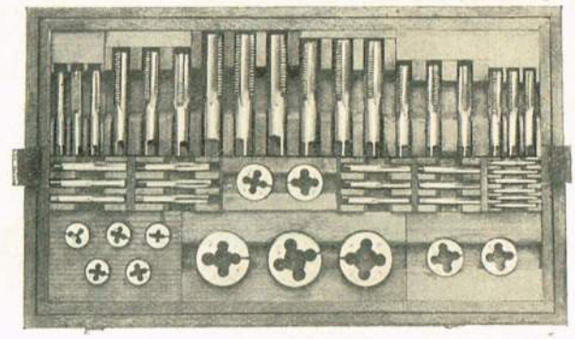


FIG. 67.
PRICES AND PARTICULARS OF WHITWORTH STANDARD SETS



Made from the finest steel, and every piece guaranteed.

Set No.	Description.	Price £ s. d.	Without Guides and with Plug Tap only. £ s. d.	Without Guides and with 2 Taps only. £ s. d.	Guides extra, each. £ s. d.
4370.	Comprising $^{1}/_{16}$, $^{3}/_{32}$, $\frac{1}{8}$, $^{5}/_{32}$, $^{3}/_{16}$, $^{7}/_{32}$, $\frac{1}{4} \times \frac{5}{8}$ Circular Adjustable Die and Taper Plug and Bottoming Taps of each sizes. Adjustable Tap Wrench and Die Stock and Seven Guides, complete in wood box	4 2 0	2 11 9	3 1 9	0 10 6
4371.	As above exactly, but dies $^{13}/_{16}$ in. diam.	4 5 0	—	—	—
4372.	Comprising $\frac{1}{8}$, $^{5}/_{32}$, $^{3}/_{16}$, $^{7}/_{32}$, $\frac{1}{4} \times {}^{13}/_{16}$ Circular Adjustable Die and Taper Plug and Bottoming Taps of each size. Adjustable Tap Wrench and Die Stock. Five Guides	3 3 0	2 2 6	2 9 9	0 7 6
4373.	As above exactly, but dies $\frac{5}{8}$ in. diam.	3 4 0	—	—	—
4374.	Comprising $^{1}/_{16}$, $^{3}/_{32}$, $\frac{1}{8}$, $^{5}/_{32}$, $^{3}/_{16}$, $^{7}/_{32}$, $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8} \times 1$ ins. diam. Circular Adjustable Dies, Taper Plug, Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Nine Guides	5 15 0	3 15 6	4 4 6	0 13 6
4375.	Comprising $\frac{1}{8}$, $^{3}/_{16}$, $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8} \times 1$ ins. Circular Adjustable Dies, Taper Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Five Guides	3 10 0	2 8 0	2 15 3	0 7 6
4376.	Comprising $\frac{1}{8}$, $^{3}/_{16}$, $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8}$, $^{7}/_{16}$, $\frac{1}{2} \times 1^{5}/_{16}$ in. diam. Circular Adjustable Dies, Taper Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Seven Guides	5 10 0	3 15 6	4 7 6	0 10 6
4377.	Comprising $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8}$, $^{7}/_{16}$, $\frac{1}{2} \times 1^{5}/_{16}$ in. diam. Circular Adjustable Dies, Taper Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Five Guides	4 6 6	3 19 9	3 9 3	0 7 6
4378.	Comprising $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8}$, $^{7}/_{16}$, $\frac{1}{2}$, $^{9}/_{16}$, $\frac{5}{8} \times 1\frac{1}{2}$ in. diam. Circular Adjustable Dies, Taper Plugs and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Seven Guides	7 8 0	5 7 0	6 2 3	0 10 6
4379.	Comprising $\frac{1}{8}$, $^{3}/_{16}$, $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8} \times 1$ in. diam. Circular Adjustable Dies, $^{7}/_{16}$, $\frac{1}{2}$, $^{9}/_{16}$, $\frac{5}{8} \times 1\frac{1}{2}$ in. diam. Circular Adjustable Dies, and Taper Plug, Bottoming Taps of each size. 2 Adjustable Tap Wrenches and Die Stocks. Nine Guides	8 10 0	6 1 0	6 18 9	0 13 6
4380.	Comprising $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8}$, $^{7}/_{16}$, $\frac{1}{2}$, $^{9}/_{16}$, $\frac{5}{8}$, $\frac{3}{4} \times 1\frac{3}{4}$ in. diam. Circular Adjustable Dies, Taper Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Eight Guides	9 0 0	6 7 6	7 6 9	0 14 0
4381.	Comprising $\frac{1}{8}$, $^{3}/_{16}$, $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8} \times 1$ in. diam. and $^{7}/_{16}$, $\frac{1}{2}$, $^{9}/_{16}$, $\frac{5}{8}$, $\frac{3}{4} \times 1\frac{3}{4}$ in. diam. Adjustable Circular Dies, Taper Plug and Bottoming Taps of each size, 2 Adjustable Tap Wrenches and Die Stocks. Ten Guides	11 0 0	8 0 3	8 12 0	0 16 3
4382.	Comprising $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8}$, $^{7}/_{16}$, $\frac{1}{2} \times 1^{5}/_{16}$ in. diam. and $^{9}/_{16}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1 \times 2\frac{1}{4}$ in. diam. Adjustable Circular Dies and Taper Plug and Bottoming Taps of each size. 2 Adjustable Tap Wrenches and Die Stocks. Ten Guides	14 12 0	10 9 6	12 0 9	1 0 0
4383.	Comprising $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2} \times 1^{5}/_{16}$ in. diam., $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $1 \times 2\frac{1}{4}$ in. diam. Adjustable Circular Stocks and Dies and Taper Plug and Bottoming Taps of each size, 2 Adjustable Tap Wrenches and Die Stocks. Seven Guides	12 5 0	9 1 0	10 5 9	0 14 6
4384.	Comprising $\frac{1}{8}$, $^{3}/_{16}$, $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8} \times 1$ in. diam., $^{7}/_{16}$, $\frac{1}{2}$, $^{9}/_{16}$, $\frac{5}{8} \times 1\frac{1}{2}$ in. diam., and $\frac{3}{4}$, $\frac{7}{8}$, $1 \times 2\frac{1}{4}$ in. diam., Adjustable Circular Dies and Taper Plug and Bottoming Taps of each size, Adjustable Wrenches and Die Stock. Twelve Guides	15 15 0	11 6 0	13 0 3	1 1 0
4385.	Comprising $\frac{1}{8}$, $^{3}/_{16}$, $\frac{1}{4}$, $^{5}/_{16}$, $\frac{3}{8} \times 1$ in. diam., $^{7}/_{16}$, $\frac{1}{2}$, $^{9}/_{16}$, $\frac{5}{8} \times 1\frac{1}{2}$ in. diam., and $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4} \times 2\frac{1}{4}$ in. diam. Adjustable Circular Dies, Taper Plug and Bottoming Taps of each size, 3 Adjustable Tap Wrenches and Die Stocks. Fourteen Guides	22 5 0	15 11 6	18 5 3	1 6 0
4386.	Comprising $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2} \times 1^{5}/_{16}$ in. diam., $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4} \times 2\frac{1}{4}$ in. diam. Circular Dies, Taper Plug and Bottoming Taps of each size, 2 Adjustable Tap Wrenches and Die Stocks. Nine Guides	18 4 0	12 14 6	14 19 6	0 19 6

Owing to the difficulty of cutting a concentric thread by hand, it is advisable to order the above with Guides.

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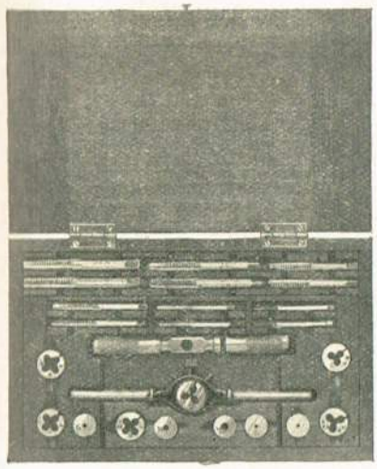

TAPS AND DIES.

IN SOLID OAK CASES

ALL OUR TAPS & DIES ARE MANUFACTURED FROM FINEST CRUCIBLE STEEL

Every One Guaranteed.

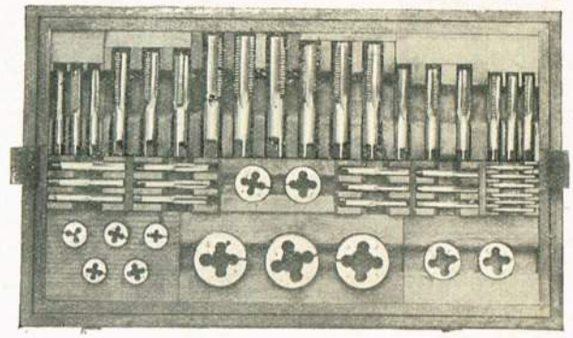

Fig. 67.

CYCLE SETS.

Set. No.	Description.	Price. £ s. d.	Without Guides and with Plug Tap only. £ s. d.	Without Guides and with 2 Taps only. £ s. d.	Guides extra, each. £ s. d.
4391.	Comprising $^3/_{16}$, $\frac{1}{4}$, ·266″, ·281″, $^5/_{16}$, $\frac{3}{8}$, $^9/_{16}$, $^9/_{16}$ L.H. × 1″ diam. Adjustable Circular Dies, Taper Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Seven Guides	4 6 0	2 16 0	3 5 6	0 10 6
4392.	Comprising $^3/_{16}$ 24″, $^3/_{16}$ 32″, $\frac{1}{4}$ 20″, $\frac{1}{4}$ 25″, $\frac{1}{4}$ 26″, $\frac{1}{4}$ 30″, $^5/_{16}$ 18″, $^5/_{16}$ 24″, $^5/_{16}$ 26″, $^5/_{16}$ 30″, $\frac{3}{8}$ 16″, $\frac{3}{8}$ 20″, $\frac{3}{8}$ 24″, $\frac{3}{8}$ 26″, $^7/_{16}$ 14″, $^7/_{16}$ 19″, $^7/_{16}$ 20″, $^7/_{16}$ 24″, $\frac{1}{2}$ 12″, $\frac{1}{2}$ 19″, $\frac{1}{2}$ 24″, $\frac{1}{2}$ 20″, $^9/_{16}$ 20″, $^9/_{16}$ 20″ L.H. × 1″ diam. Adjustable Circular Dies, Taper and Plug Taps of each size, Adjustable Tap Wrench and Die Stock. Seven Guides	12 2 0	—	—	—

MOTOR CYCLE SET.

4393.	Comprising ·198 28″, ·256 28″, $^5/_{16}$ 18″, $^5/_{16}$ 26″, $\frac{3}{8}$ 16″, $\frac{3}{8}$ 24″, $^7/_{16}$ 20″, $^9/_{16}$ 20″, $^9/_{16}$ 20″ L.H., $\frac{1}{2}$ 20″, $\frac{5}{8}$ 18″, × $1\frac{1}{2}$″ diam. Adjustable Circular Dies, Tap and Plug Taps of each size and 18 m/m × 1·5 m/m Plug Tap, Adjustable Tap Wrench and Die Stock. Eight Guides	9 4 0	—	—	—

GAS SETS. BRITISH STANDARD.

4394.	Comprising $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ × $1\frac{1}{2}$ diam. × $\frac{3}{8}$ thick Adjustable Circular Dies, Taper and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Three Guides	3 14 6	3 1 0	—	0 4 6
4395.	Comprising $\frac{1}{2}$, $\frac{3}{4}$, 1 × $2\frac{1}{4}$ diam. × 1 in. thick, Adjustable Circular Dies, Taper and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Three Guides	9 0 0	7 8 9	—	0 7 6
4396.	Comprising $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ × $1\frac{1}{2}$ diam., $\frac{1}{2}$, $\frac{3}{4}$, 1 in. × $2\frac{1}{4}$ in diam. Adjustable Circular Dies, Taper and Bottoming Taps of each size, 2 Adjustable Tap Wrenches and Die Stock. Six Guides	12 19 6	10 15 3	—	0 12 0
4397.	Comprising $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 in. × $2\frac{1}{4}$ in. diam. Adjustable Circular Dies, Taper and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Six Guides	12 14 0	10 6 9	—	0 15 0

COMPLETE AUTOMOBILE SETS. A NECESSITY IN EVERY GARAGE.

4398.	Comprising $\frac{1}{4}$ 20″, $^5/_{16}$ 18″, $\frac{3}{8}$ 15″, $^7/_{16}$ 14″, $\frac{1}{2}$ 13″, $\frac{5}{8}$ 11″, $\frac{3}{4}$ 10″, $\frac{7}{8}$ 9″, 1 8″, × $1^5/_{16}$″ diam., $\frac{1}{4}$ 20″, $^5/_{16}$ 24″, $\frac{3}{8}$ 24″, $^7/_{16}$ 20″, $\frac{1}{2}$ 20″, $\frac{5}{8}$ 18″, $\frac{3}{4}$ 16″, $\frac{7}{8}$ 14″, 1 14″ × $2\frac{1}{4}$″ Adjustable Circular Dies and Taper Plug and Bottoming Tap of each size, 2 Adjustable Tap Wrenches and Die Stocks. Nine Guides	23 2 0	15 0 0	18 10 0	1 2 6
4399.	Ford Owner's Set, comprising 6 32″, 10 24″, 10 32″, 12 24″, 14 24″, $^7/_{32}$ 32″, $\frac{1}{4}$ 20″, $^5/_{16}$ 18″, $^5/_{16}$ 24″, $\frac{3}{8}$ 16″, $\frac{3}{8}$ 24″, $^{13}/_{32}$ 16″, $^7/_{16}$ 14″, $^7/_{16}$ 20″, $\frac{1}{2}$ 20″, $\frac{1}{8}$″ pipe × 1″ diam. Adjustable Circular Dies Plug Tap of each size, Sparking Plug Tap, Adjustable Tap Wrench and Die Stock	5 10 0	—	—	—
4400.	Ford Engineer's Set, comprising 6 32″, 10 34″, 10 32″, 12 24″, 14 24″, $^7/_{32}$ 32″, $\frac{1}{4}$ 20″, $^5/_{16}$ 18″, $^5/_{16}$ 24″ × 1″ diam., $\frac{3}{8}$ 16″, $\frac{3}{8}$ 24″, $^{13}/_{32}$ 16″, $^7/_{16}$ 14″, $^7/_{16}$ 20″, $\frac{1}{2}$ 20″, $\frac{1}{8}$″ pipe × $1^5/_{16}$″ diam. Adjustable Circular Dies, Taper Plug and Bottoming Taps of each size, Sparking Plug Tap, 2 Adjustable Tap Wrenches and Die Stocks. Fifteen Guides	12 0 0	—	—	—
4401.	Comprising 6 32″, 10 24″, 10 32″, 12 24″, 14 24″, $^7/_{32}$ 32″ × 1″ diam., $\frac{1}{4}$ 20″, $^5/_{16}$ 18″, $\frac{3}{8}$ 16″, $^7/_{16}$ 14″, $\frac{1}{2}$ 13″, $\frac{5}{8}$ 11″, $\frac{3}{4}$ 10″, $\frac{7}{8}$ 9″, 1 8″ × $1^5/_{16}$″ diam., $\frac{1}{4}$ 28″, $^5/_{16}$ 24″, $\frac{3}{8}$ 24″, $^7/_{16}$ 20″, $\frac{1}{2}$ 20″, $\frac{5}{8}$ 18″, $\frac{3}{4}$ 16″, $\frac{7}{8}$ 14″, 1 14″ × $2\frac{1}{4}$″ diam. Adjustable Circular Dies, Taper Plug and Bottoming Taps of each size, 3 Adjustable Tap Wrenches and Die Stocks. Fifteen Guides	28 0 0	17 18 0	19 4 0	1 13 6

Owing to the difficulty of cutting a concentric thread by hand, it is advisable to order the above with Guides.

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TAPS AND DIES.

BRITISH ASSOCIATION

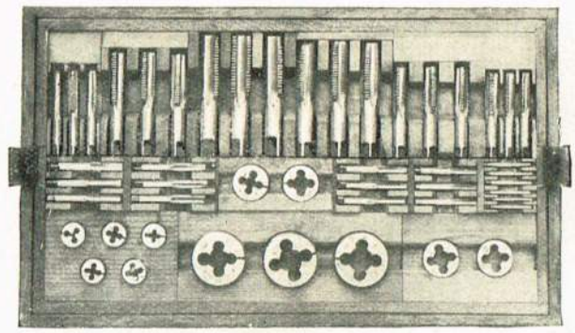


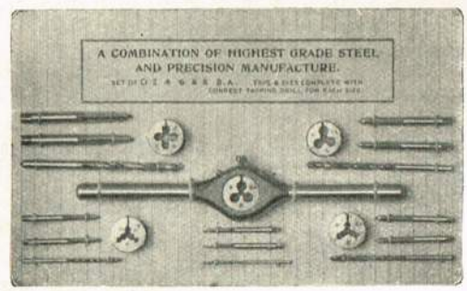
Fig. 67.

TAPS AND DIES IN OAK CASES

Set. No.	Description.	Price. £ s. d.	Without Guides and with Plug Tap only. £ s. d.	Without Guides and with 2 Taps only. £ s. d.	Guides extra, each. £ s. d.
4387.	Comprising 0 to 6 × $^{13}/_{16}$ in. diam. Adjustable Circular Dies, Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Seven Guides	3 8 6	3 0 0	—	0 10 6
4388.	Comprising 0 to 6 × $\frac{5}{8}$ in. diam. Adjustable Circular Dies, Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Seven Guides	3 4 0	2 5 0	—	0 10 6
4389.	Comprising 0 to 10 × $^{13}/_{16}$ in. diam. Adjustable Circular Dies, Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Eleven Guides	4 19 6	3 7 0	—	0 16 6
4390.	Comprising 0 to 10 × 1 in. diam. Adjustable Circular Dies, Plug and Bottoming Taps of each size, Adjustable Tap Wrench and Die Stock. Eleven Guides	5 3 0	3 13 6	—	0 16 6

Owing to the difficulty of cutting a concentric thread by hand, it is advisable to order the above sets with guides.

BRITISH ASSOCIATION FIG. 68.



TAPS AND DIES Mounted on Cards.

Set No.	Without Core Drill set with Taper and Plug Tap and Circular Die for each Size and Die Stock.	Price per set.	Price per Set with Plug Tap only.	Set No.	With Core Drill for each Size. Set with Taper and Plug Tap and Circular Die for each Size and Die Stock.	Price per set.	Price per Set with Plug Tap only.
8	0 2 4 6 8	23/6	20/–	19	0 2 4	16/10	14/10
9	4 6 8	15/–	13/–	20	2 4 6	16/6	14/6
10	2 4 6	15/–	13/–	21	4 6 8	16/6	14/6
11	0 2 4	15/–	13/–	22	1 3 5	16/6	14/6
12	1 3 5	15/–	13/–	23	1 3 5 7	22/–	19/4
13	2 4 6 8	20/–	18/–	24	2 4 7 8	22/-	19/4
14	1 3 5 7	20/–	18/–	25	2 4 6 8	22/–	19/4
15	2 4 7 8	20/–	18/–	26	0 2 6 8	23/–	22/8

FIG. 69. WHITWORTH SETS ON CARDS.

16	$\frac{1}{8}$ $^{3}/_{16}$ $\frac{1}{4}$	15/–	13/–	27	$\frac{1}{8}$ $^{3}/_{16}$ $\frac{1}{4}$	16/8	14/8
17	$^{3}/_{32}$ $\frac{1}{8}$ $^{5}/_{32}$ $^{3}/_{16}$ $^{7}/_{32}$ $\frac{1}{4}$	29/–	24/6	28	$^{3}/_{32}$ $\frac{1}{8}$ $^{5}/_{32}$ $^{3}/_{16}$ $^{7}/_{32}$ $\frac{1}{4}$	32/–	27/6
18	$^{3}/_{32}$ $\frac{1}{8}$ $^{5}/_{32}$ $^{3}/_{16}$	20/–	14/–	29	$^{3}/_{32}$ $\frac{1}{8}$ $^{5}/_{32}$ $^{3}/_{16}$	22/–	20/–
18A	$\frac{1}{4}$ $^{5}/_{16}$ $\frac{3}{8}$ $^{7}/_{16}$ $\frac{1}{2}$	50/–	—		Mounted on polished board.		

Sets can be made to suit Customers' own specification.

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ENGINEERS' STOCKS AND DIES.

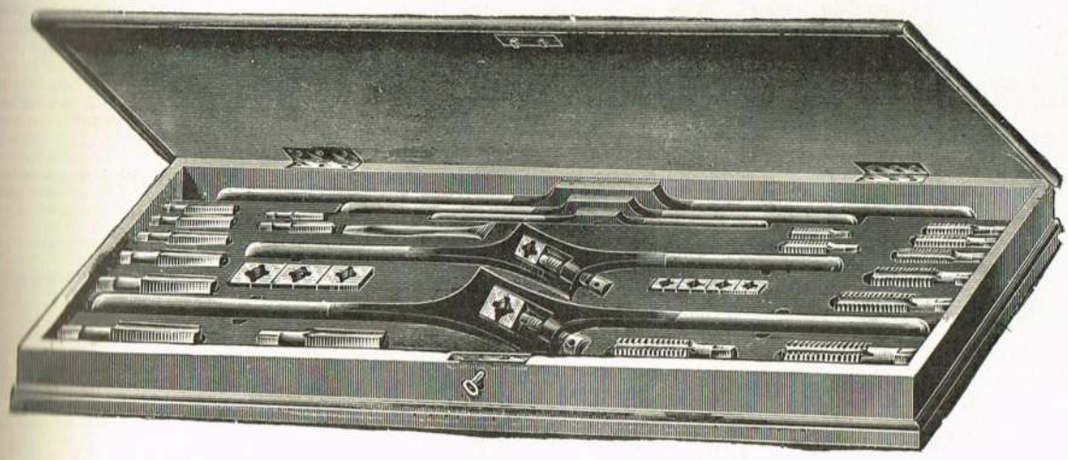

Fig. 70.

Whitworth Standard Threads. Fitted into Deal Cases, with Tap Wrenches, complete.

Sets Q.R.S. are in two cases.

Best Quality Sheffield manufacture from the highest grade steel.

To screw	Set	With taper and plug taps £ s. d.	With taper Second and plug taps £ s. d.
3/8" 3/8" 7/16" 1/2"	A	5 4 0	5 19 0
3/8" 1/2" 5/16" 3/8" 7/16" 1/2"	B	7 14 6	8 12 6
5/16" 3/8" 1/2" 5/8"	C	6 14 6	7 9 6
3/8" 1/2" 5/16" 3/8" 7/16" 1/2" 5/8"	D	9 6 0	9 17 6
1/2" 5/8" 3/4"	E	7 17 0	8 15 0
5/16" 3/8" 7/16" 1/2" 5/8" 3/4"	F	9 6 6	10 9 6
3/8" 1/2" 5/16" 3/8" 7/16" 1/2" 5/8" 3/4"	G	11 11 0	12 19 0
1/2" 5/8" 3/4" 7/8" 1"	H	13 0 0	14 11 6
1/2" 5/8" 3/4" 7/8" 1"	I	13 16 6	15 12 6
5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1"	J	15 0 0	17 0 0
3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4"	K	20 7 0	23 3 6
1/2" 3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4"	L	20 13 6	23 18 6
1/2" 5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4"	M	22 15 0	26 3 6
3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2"	N	31 2 6	36 7 0
1/2" 3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2"	O	31 7 6	36 14 0
5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2"	P	32 8 6	38 3 0
1/2" 3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2" 1 3/4" 2"	Q	53 0 0	62 14 0
1/2" 3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2" 1 5/8" 1 3/4" 1 7/8" 2"	R	64 17 0	77 8 0
1/2" 5/16" 3/8" 7/16" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2" 1 5/8" 1 3/4" 1 7/8" 2"	S	66 0 0	79 7 0

Fig. 71. ENGINEERS' STOCKS AND DIES WITHOUT CASES.

To Screw	Without taps £ s. d.	With taper and plug taps £ s. d.	With taper Second and plug taps £ s. d.	Dies per pair
1/4"	1 2 6	1 6 6	1 8 6	4/6
5/16" 1/4"	1 7 0	1 15 0	1 19 0	
3/8" 1/4"	1 11 6	2 3 6	2 9 6	
7/16" 5/16" 1/4"	1 16 0	2 12 0	3 0 0	
1/2"	1 2 6	1 7 0	1 9 6	4/6
9/16"	1 7 0	1 16 0	2 0 0	
5/8" 3/8"	1 11 6	2 4 0	2 10 6	
11/16" 5/16" 3/8"	1 16 0	2 13 0	3 1 0	
3/4" 5/16" 3/8"	2 0 6	3 1 6	3 11 6	
13/16" 7/16"	2 3 0	3 1 6	3 10 6	5/-
7/8"	1 8 0	1 14 0	1 17 0	5/-
15/16" 1/2"	1 18 0	2 12 6	3 0 0	
1" 1/2"	1 18 0	2 13 6	3 2 0	
1 1/16" 9/16" 1/2"	2 3 0	3 2 0	3 11 0	
1 1/8" 5/8" 9/16"	2 3 0	3 3 0	3 13 0	
1 3/16" 11/16" 5/8" 9/16"	2 8 0	3 12 0	4 4 0	
1 1/4"	1 14 0	2 2 0	2 6 0	6/6
1 5/16" 3/4"	2 7 0	3 6 0	3 15 0	
1 3/8" 13/16" 3/4"	2 13 6	3 16 0	4 7 6	
1 7/16" 15/16" 13/16" 3/4"	2 13 6	3 17 6	4 9 6	
1 1/2" 7/8" 13/16" 3/4"	2 13 6	4 1 0	4 14 6	
1 9/16" 15/16" 7/8" 13/16" 3/4"	3 0 0	4 7 0	5 0 0	
1 5/8" 7/16" 1/2" 9/16"	3 6 6	4 18 6	5 14 6	
1 11/16"	2 1 0	2 11 0	2 16 0	8/-
1 3/4" 15/16" 7/8"	2 17 0	4 1 0	4 13 0	
1 13/16" 3/4"	3 5 0	4 14 0	5 8 0	
1 7/8" 11/16" 3/4"	3 5 0	5 1 0	5 19 0	
1 15/16" 13/16" 3/4"	3 13 0	5 6 0	6 2 0	
2" 15/16" 7/8" 13/16" 3/4"	3 13 0	5 7 0	6 4 0	
2 1/16"	3 15 0	5 6 0	6 1 6	10/-
2 1/8" 1/2"	4 5 0	6 2 0	7 1 0	
2 3/16" 9/16" 1/2"	4 5 0	6 11 0	7 14 0	
2 1/4" 11/16" 9/16" 1/2"	4 15 0	6 17 0	7 17 6	
1"	2 15 0	3 11 0	3 19 0	10/-
5/8" 3/8" 1"	3 15 0	5 9 0	6 6 0	
3/4" 7/8" 1"	3 15 0	5 14 0	6 13 6	
13/16" 3/4" 7/8" 1	4 5 0	6 12 0	7 15 6	
7/8" 5/8" 3/4" 7/8" 1"	4 15 0	7 8 0	8 14 6	
15/16" 1" 1 1/8"	5 3 0	7 12 0	8 16 6	¼P/-
1 1/16" 3/4" 7/8" 1" 1 1/8"	5 17 0	8 16 0	10 5 6	
1 1/8" 5/8" 3/4" 7/8" 1" 1 1/8"	6 11 0	9 18 0	11 11 6	
1 1/4"	3 15 0	5 1 0	5 14 0	14/-
1 3/8" 3/4" 1" 1 1/4"	5 3 0	7 15 0	9 1 0	
1 7/16" 7/8" 1" 1 1/4"	5 3 0	7 18 0	9 5 6	
1 1/2" 1 1/8" 1 1/4"	5 3 0	8 5 0	9 16 0	
1 9/16" 7/8" 1" 1 1/4"	5 17 0	9 2 0	10 14 6	
1 5/8" 11/16" 7/8" 1" 1 1/4"	5 17 0	9 12 0	11 9 6	
1 3/4" 7/8" 1" 1 1/8" 1 1/4"	6 11 0	10 16 0	18 0 0	
1 7/8" 1 1/8" 1 1/4" 1 3/8"	5 17 0	10 15 0	13 0 0	
1 1/2"	4 16 0	6 18 0	8 0 0	
1 5/8" 1" 1 1/4" 1 1/2"	6 14 0	10 18 0	13 0 0	
1 3/4" 11/16" 1 3/8" 1 1/2"	6 14 0	11 16 0	14 7 0	
1 7/8" 1 1/8" 1 1/4" 1 1/2"	7 13 0	12 9 0	14 17 0	
1 15/16" 1 1/4" 1 3/8" 1 1/2"	7 13 0	13 15 0	16 16 0	
2" 1 1/8" 1 1/4" 1 3/8" 1 1/2"	8 12 0	15 10 0	19 0 0	
1 3/4"	6 8 0	9 12 0	11 4 0	24/-
1 7/8" 1 1/2" 1 3/4"	8 16 0	15 8 0	18 14 0	
1 15/16" 1 5/8" 1 3/4"	8 16 0	16 14 0	20 13 0	
2" 1 1/4" 1 1/2" 1 3/4"	10 0 0	17 8 0	21 2 0	
2 1/8" 1 1/2" 1 5/8" 1 3/4"	10 0 0	19 12 0	24 8 0	
2 1/4" 1 3/8" 1 1/2" 1 5/8" 1 3/4"	11 4 0	22 2 0	27 11 0	
2"	7 10 0	12 4 0	14 11 0	30/-
2 1/4" 1 1/2" 2"	10 10 0	13 12 0	22 13 0	
2 1/2" 1 3/4" 2"	10 10 0	21 10 0	25 10 0	
2 3/4" 1 7/8" 2"	10 10 0	22 6 0	28 4 0	
2 7/8" 2 1/4" 1 3/4" 2"	12 0 0	23 6 0	29 0 0	
3" 2 1/8" 1 7/8" 2"	12 0 0	24 8 0	33 12 0	
3 1/4" 2 1/2" 1 5/8" 1 3/4" 1 7/8" 2"	13 10 0	30 0 0	38 5 0	

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STOCKS AND DIES.

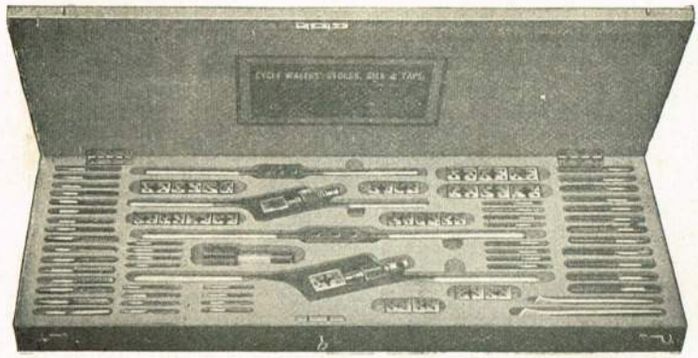

Fig. 72. Best Warranted **Cycle Makers' Stocks and Dies in Cases,** with taper and plug taps to each size.

Set No. 1.

Comprises 2 stocks, 2 tap wrenches, 8 pairs dies, and 16 taps screwing

	3/16″	1/4″	5/16″
Threads per inch	32	25 & 30	26
	3/8″	9/16″	9/16″
Threads per inch	20 & 26	20 right	20 left hand.

Price **£7 14 0.**

Set No. 2.

Comprises 2 stocks, 2 tap wrenches, 24 pairs dies and 49 taps, including 1 bracket tap 1 3/8″ diam. × 24 threads per inch, screwing

	3/16″	1/4″	5/16″
Threads per inch	24 & 32	20,25,26,30	18,24,26,30
	3/8″	7/16″	1/2″
Threads per inch	16,20,24,26	14,19,20,24	12,19,20,24
		9/16″	9/16″
Threads per inch		20 right	20 left hand.

Price **£15 10 0.**

Set No. 3.

For "Ford" Cars.

Comprises 2 stocks, 2 tap wrenches, 10 pairs dies, 20 taps, screwing

	1/4″	9/32″	5/16″	3/8″
Threads per inch	20	18	24	16 & 24
		7/16″	1/2″	9/16″
Threads per inch		14 & 20	18 & 20	18

Price **£9 14 0.**

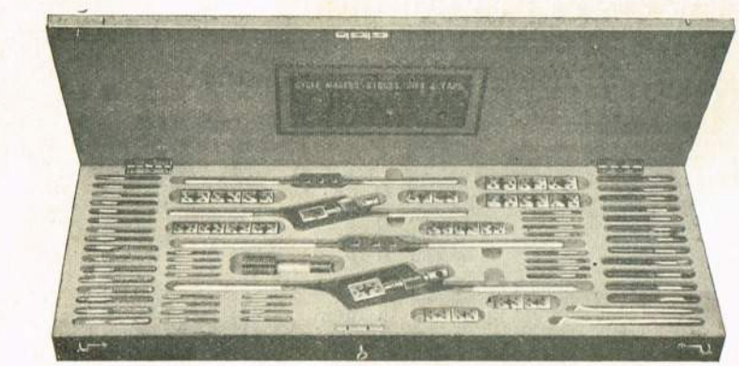

Fig. 73. Cycle Makers' Stocks and Dies without Cases.

	Set A.	Set B.	Set C.	Set D.
	1/8″ 3/16″ 1/4″	1/4″ 5/16″ 3/8″	3/8″ 7/16″ 1/2″	7/16″ 1/2″ 9/16″
Without taps	**31/6**	**31/6**	**38/–**	**38/–** per set.
With taper & plug taps	**43/6**	**44/–**	**53/6**	**55/6** ,,
Additional Dies	**4/6**	**4/6**	**5/–**	**5/–** pair.
Tap Wrenches	**6/–**	**6/6**	**8/–**	**8/–** each.

Fig. 74. Best Cast Steel Taper and Plug Taps—Cycle Threads.

1/16″ 1/8″ 3/16″ 1/4″	5/16″	3/8″	7/16″	1/2″	9/16″	1 3/8″ bracket tap
2/–	**2/2**	**2/4**	**2/8**	**3/–**	**3/6**	**9/–** each.

Fig. 75 Best Warranted **Metric Thread Stocks, Dies and Taps in Cases,** with taper and plug tap to each size.

Table of International Screw Threads.

Diam. of bolt in m/m	3, 3·5	4, 4·5	5	6, 7
Pitch in m/m	0·55	0·7	0·85	1·0
Diam. of bolt in m/m	8, 9	10, 11		12
Pitch in m/m	1·25	1·5		1·75
Diam. of bolt in m/m	14, 16	18, 20, 22		24, 27
Pitch in m/m	2·0	2·5		3·0

Set No. 1M.

Comprises 1 stock, 2 tap wrenches, 8 pairs dies, tommy and 16 taps, screwing 5, 6, 7, 8, 9, 10, 11, 12 m/m.

Price **£8 10 0.**

Set No. 2M.

Comprises 2 stocks, 3 tap wrenches, 16 pairs dies, tommy and 32 taps, screwing 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 m/m.

Price **£18 6 0.**

Set No. 3M.

Comprises 2 stocks, 3 tap wrenches, 14 pairs dies, tommy and 28 taps, screwing 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 27, 30, 33 m/m.

Price **£29 3 0.**

Fig. 76. Metric Thread Stocks and Dies without Cases.

Stock	A	B	C	D
Sizes	3, 4, 5	5, 6, 7,	6, 8, 10	8, 10, 12 m/m
Without taps	**32/–**	**32/–**	**34/–**	**38/6** per set.
With taper and plug taps	**47/–**	**47/4**	**51/2**	**58/2** ,,
Additional dies	**4/6**	**4/6**	**5/–**	**5/–** per pair.
Tap wrenches	**6/–**	**6/–**	**6/6**	**8/–** each.
Stock	E	F	G	
Sizes	12, 14, 16	16, 18, 20	20, 22, 24 m/m	
Without taps	**48/–**	**52/–**	**76/–** per set.	
With taper and plug taps	**74/10**	**92/–**	**132/–** ,,	
Additional dies	**6/6**	**8/–**	**10/–** per pair	
Tap wrenches	**10/6**	**13/–**	**16/6** each	
Stock	H	I	J	
Sizes	27, 30, 33	33, 36, 39	42, 45, 48, 52 m/m	
Without taps	**105/–**	**136/–**	**245/–** per set	
With taper and plug taps	**193/8**	**258/–**	**561/–** ,,	
Additional dies	**14/–**	**19/–**	**30/–** per pair	
Tap wrenches	**22/–**	**31/6**	**52/–** each	

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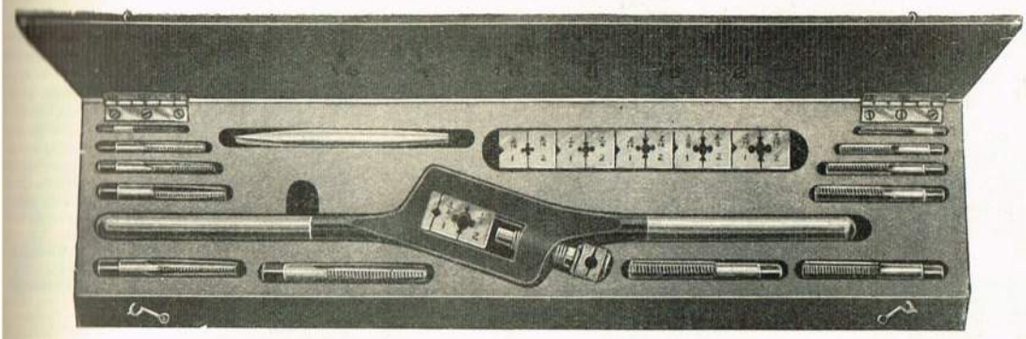
STOCKS AND DIES FOR IRON PIPES.



BRITISH STANDARD THREADS AND DIAMETERS.

Fitted into deal cases, with locks and keys. Each set complete with taper and plug taps and tap wrench.

The large stocks in Sets G, H and over are made with removable handles to economise space and reduce cost of chests.

Fig. 77. Angular or Straight Pattern. Fitted in Deal Cases.

To Screw.	Set	Price £ s. d.
¼″ ⅜″ ½″ ¾″	G.A.	7 7 6
¼″ ⅜″ ½″ ¾″ 1″	G.B.	11 5 6
¼″ ⅜″ ½″ ¾″ 1″ 1¼″	G.C.	16 10 6
¼″ ⅜″ ½″ ¾″ 1″ 1¼″ 1½″	G.D.	22 0 0
¼″ ⅜″ ½″ ¾″ 1″ 1¼″ 1½″ 2″	G.E.	34 16 6
¼″ ⅜″ ½″ ¾″ 1″ 1¼″ 1½″ 1¾″ 2″	G.F.	40 9 6

To Screw.	Set	Price £ s. d.
¼″ ⅜″ ½″ ¾″ 1″ 1¼″ 1½″ 1¾″ 2″ 2¼″	G.H.	50 15 0
2″ 2¼″ 2½″	G.I.	34 16 6
1¾″ 2″ 2¼″ 2½″	G.J.	39 14 6
¼″ ⅜″ ½″ ¾″ 1″ 1¼″ 1½″ 1¾″ 2″ 2¼″ 2½″	G.J.J.	61 10 0
2¼″ 2½″ 3″	G.K.	43 13 6
2¼″ 2½″ 2¾″ 3″	G.L.	53 19 6
3″ 3¼″ 3½″ 4″	G.M.	102 10 0

STOCKS AND DIES.
without deal cases.

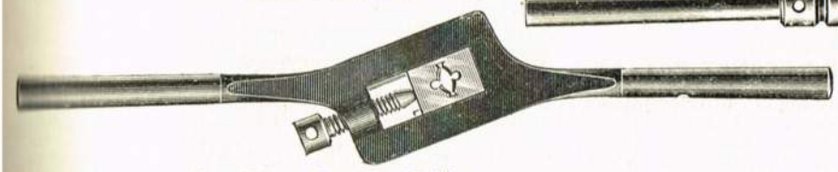


Fig. 79. Straight Pattern.

Fig. 78. Angular Pattern.

To screw.	Without taps. £ s. d.	With taper and plug taps. £ s. d.	Dies per pair.
¼″	1 7 6	1 12 6	5/–
¼″ ⅜″	1 12 6	2 2 6	
¼″ ⅜″	1 7 6	1 13 6	5/–
¼″ ⅜″	1 12 6	2 3 6	
¼″ ⅜″ ½″....	1 17 6	2 14 0	
¼″ ⅜″	1 11 0	1 18 6	6/3
¼″ ⅜″ ½″	1 17 6	2 10 0	
¼″ ⅜″ ½″....	2 3 6	3 1 6	
¼″ ⅜″ ½″ ¾″	2 9 6	3 12 6	
¼″ ⅜″ ½″....	2 17 6	4 1 0	8/–
¼″ ⅜″	2 2 0	2 14 0	8/–
¼″ ⅜″	2 10 0	3 9 0	
¼″ ⅜″ ½″....	2 17 6	4 2 6	
¼″ ⅜″ ½″ ¾″	3 5 0	4 15 0	
¼″ ⅜″ ½″ ⅝″ ¾″	3 13 0	5 13 6	
¼″	2 17 0	3 13 0	10/–
¼″ ⅜″ ½″	3 7 0	4 15 0	
¼″ ⅜″ ½″ ¾″....	3 17 0	5 12 0	
¼″ ⅜″ ½″ ¾″ 1″	4 7 0	6 8 0	
¼″ ⅜″ ½″ ¾″ 1″	4 17 0	7 3 0	
⅜″	3 13 6	5 0 0	14/–
⅜″ ½″	4 7 0	6 9 0	
⅜″ ½″ ¾″	5 0 0	7 14 6	
⅜″ ½″ ¾″ 1″	5 14 0	8 16 0	
½″	3 17 0	5 15 0	17/–
½″ ¾″	4 14 0	7 18 0	
½″ ¾″ 1″	5 11 0	9 11 0	
½″ ¾″ 1″ 1¼″	6 8 0	11 0 0	
½″ ¾″ 1″ 1¼″ 1½″	7 5 0	12 5 0	

To screw.	Without taps. £ s. d.	With taper and plug taps. £ s. d.	Dies per pair.
¾″	6 12 0	9 6 0	25/–
1″ 1¼″	7 17 0	12 8 6	
1″ 1¼″ 1½″	9 2 0	15 0 0	
1″ 1¼″ 1½″ 1¾″	10 7 0	17 0 0	
2″	7 2 0	10 16 0	17/–
1½″ 2″	8 9 0	14 0 0	
1¼″ 1½″ 2″	9 16 0	16 15 0	
1½″ 1¾″ 2″	9 16 0	18 2 0	
1″ 1¼″ 1½″ 2″	11 3 0	18 17 0	
1¼″ 1½″ 1¾″ 2″	11 3 0	20 15 0	
2¼″	8 0 0	12 12 0	31/6
2″ 2¼″	9 11 6	17 18 0	
1½″ 2″ 2¼″	11 3 0	21 7 6	
1¾″ 2″ 2¼″	11 3 0	22 3 6	
1¼″ 1½″ 2″ 2¼″	12 14 6	25 13 0	
2½″	8 12 0	14 12 0	34/–
2¼″ 2½″	10 6 0	21 0 0	
1½″ 2″ 2½″	12 0 0	23 12 0	
2″ 2¼″ 2½″	12 0 0	26 8 0	
1½″ 2″ 2¼″ 2½″	13 14 0	30 0 0	
3″	10 17 0	19 0 0	40/–
2½″ 3″	12 17 0	27 0 0	
2″ 2½″ 3″	14 17 0	32 15 0	
2¼″ 2½″ 3″	14 17 0	33 15 0	
2½″ 2¾″ 3″	14 17 0	36 13 0	
2″ 2¼″ 2½″ 3″	16 17 0	39 10 0	
2¼″ 2½″ 2¾″ 3″	16 17 0	43 10 0	
4″	20 0 0	38 8 0	75/–
3½″ 4″	23 15 0	55 19 0	
3″ 3½″ 4″	27 10 0	68 18 0	
3″ 3¼″ 3½″ 4″	31 5 0	84 5 0	

Same Prices for Angular or Straight Pattern.

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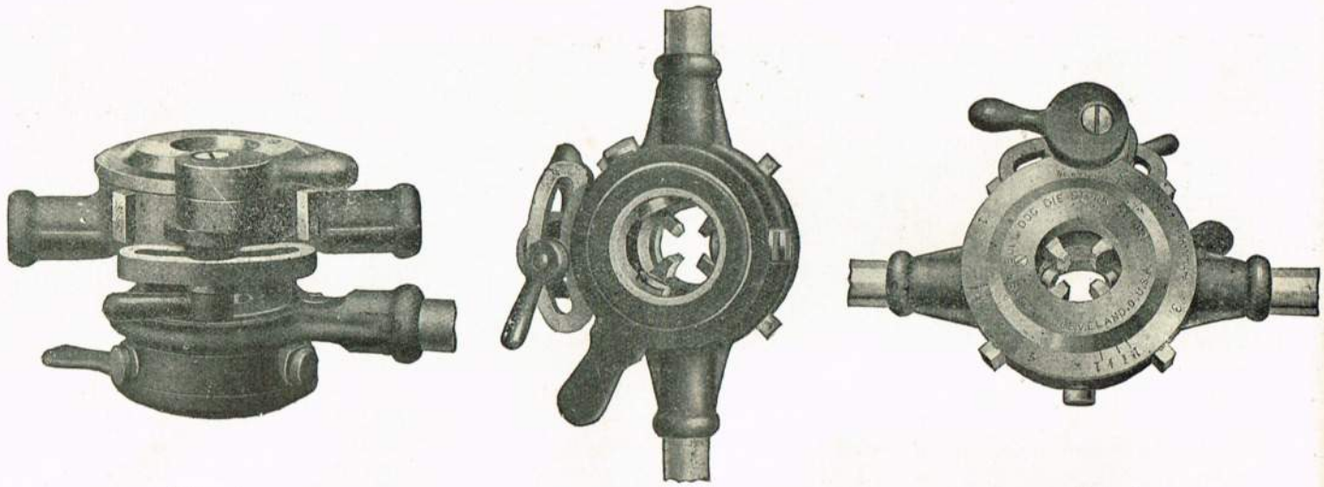
OSTER BULL-DOG DIE STOCKS.



Side view. Top view.

DESCRIPTION OF NON-RATCHET PATTERN. Fig. 80. Nos. 101—107½.

The **Bull-Dog Screwing Tackle** are all of the same style and description. These tools are recommended if you wish to cover a long range of sizes. They are specially suitable if you are required to carry the tool and dies from job to job. The Bull-Dog sets are equipped with full-width dies of correct taper, and will cut a properly tapered screw of ¾″ taper to the foot. When the fittings are screwed on, the joints will be tight. The dies, while they are full width, can also be termed "easy cutting dies," because they are ground with the proper rake, and can be operated by one man on all sizes up to 2″. The die cam is graduated to exact standard size, and any slight variation in size can be obtained. When once set, you can repeat without resetting. For gas jobs, conduit and steam work, this feature is very important. The tubes can be butted in the couplings, and for fine work the cut can be made so that the screw is not exposed to view.

DESCRIPTION OF RATCHET PATTERN. Fig. 81. Nos. 102R—107½R.

The description of the regular sets above fully applies to these ratchet patterns. The tools are of the same general design with the addition of a ratchet for operating in close quarters. The ratchet gear is large and strong, and completely encased to exclude chips and dirt. When wanted for right and left hand be sure to state so on your order. No bushings are furnished because the guides are adjustable for all sizes, as catalogued below. The Bull-Dog Ratchet Sets are made without a leader screw. This makes it possible to equip the tools with dies for a longer range of sizes. The tools may be fitted with dies for screwing casing of any special pitch.

These tools are made with two handles in the body and with one handle in the ratchet part, that the tool might be used at will with two handles as a regular or with one handle as a ratchet. Two handles are supplied with each tool.

The list prices include the tool or die holder, a complete set of right-hand dies, and a set of tubular handles.

PRICES AND SPECIFICATION.

Complete Tool, Die Holders, Dies and Tubular Handles.

No.	Weight lbs.	Screwing pipe sizes inches	Sets of dies	Price complete	Price—Extra Dies R. or L.
101	6¼	¼ and ⅜; ½ and ¾	2	£2 7 11	£0 10 5
102	11	¼ and ⅜; ½ and ¾; 1 and 1¼	3	£3 10 10	£0 12 6
103	17	1 and 1¼; 1½, 1¾ and 2	2	£4 11 8	£0 14 7
104	17	½ and ¾; 1 and 1¼; 1½, 1¾ and 2	3	£5 4 2	£0 14 7
104½	17	¼ and ⅜; ½ and ¾; 1 and 1¼; 1½, 1¾ and 2	4	£5 16 8	£0 14 7
105	44	1½, 1¾ and 2; 2¼, 2½, 2¾ and 3	2	£8 6 8	£1 0 10
105½	47	1 and 1¼; 1½, 1¾ and 2; 2¼, 2½, 2¾ and 3	3	£8 19 2	£1 0 10
107	74	2¼, 2½, 2¾ and 3; 3½ and 4	2	£11 9 2	£1 5 0
107½	78	1½, 1¾ and 2; 2¼, 2½, 2¾ and 3; 3½ and 4	3	£12 3 9	£1 5 0
		Nos. 101 and 102 can be supplied with ⅛″ dies at an extra cost of 1 set of dies as above.			
102R	14	¼ and ⅜; ½ and ¾; 1 and 1¼	3	£4 3 4	£0 12 6
103R	22	1 and 1¼; 1½, 1¾ and 2	2	£5 12 6	£0 14 7
104R	23	½ and ¾; 1 and 1¼; 1½, 1¾ and 2	3	£6 5 0	£0 14 7
105R	55	1½, 1¾ and 2; 2¼, 2½, 2¾ and 3	2	£10 8 4	£1 0 10
105½R	58	1 and 1¼; 1½, 1¾ and 2; 2¼, 2½, 2¾ and 3	3	£11 0 10	£1 0 10
107R	110	2¼, 2½, 2¾ and 3; 3½ and 4	2	£12 10 0	£1 5 0
107½R	114	1½, 1¾ and 2; 2¼, 2½, 2¾ and 3; 3½ and 4		£13 4 7	£1 5 0
		CONDUIT SIZES.			
101C	6¼	½ and ⅝ (18 T.P.I.); ¾ (16 T.P.I.)	2	£2 7 11	£0 10 5
102C	11	½ and ⅝ (1 T.P.I.); ¾ and ⅞; 1 and 1¼ (16 T.P.I.) 1½ (14 T.P.I.)	4	£3 18 0	£0 12 6
103C	17	¾ and ⅞ (16 T.P.I.); 1 and 1¼ (16 T.P.I.); 1½ (14 T.P.I.) 2 (14 T.P.I.)	4	£5 8 4	£0 14 7
		CONDUIT AND PIPE SIZES COMBINED.			
101CP	7	Pipe ¼—¾ Conduit ½—¾	2 and 2	£3 0 5	£0 10 5
102CP	12½	,, ¼—1¼ ,, ½—1½	3 and 4	£5 0 0	£0 12 6
103CP	19	,, 1—2 ,, ¾—2	2 and 4	£6 5 0	£0 14 7

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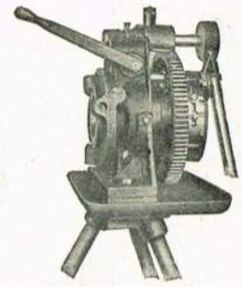
HAND SCREWING MACHINES.

Front view.

Fig. 82. OSTER LIGHT HAND PIPE SCREWING MACHINES.

No.	15	16	17
Pipe threading sizes	¼ to 2	2½ to 4	2½ to 6
Range for rods, inches	½ to 1¼	⅞ to 1⅝	1⅛ to 2
Shortest piece that can be threaded without nipple holder, inches	6	9½	9½
Bushings supplied for sizes of pipe, inches	¼ to ¾	1 to 2	1 to 3
No. of sets of dies	4	1	4
Extra sets of dies for lower range, inches	—	1	2
Measurements with tripod, inches	—	35 × 24 × 23	36 × 25 × 25
Weight with tripod, lbs.	—	—	—
Weight with bench machine, lbs.	77½	160	290
Gross weight with tripod, lbs.	150	400	550
Gross weight bench, lbs.	—	310	425
Price complete with tripod	**430/–**	**770/–**	**1195/–**
Price of extra dies, per set of 4 pieces	**25/-**	**33/4**	**41/8**



Side view.

The machines are geared and operated with a ratchet handle for large size and with a crank handle for smaller sizes. Are portable and convenient. A separate pipe vice is unnecessary. The dies adjustable for undersize or oversize cutting by means of a small handle operating the dies. Nos. 15 and 17 can be supplied with left-hand dies, but No. 16 cannot.

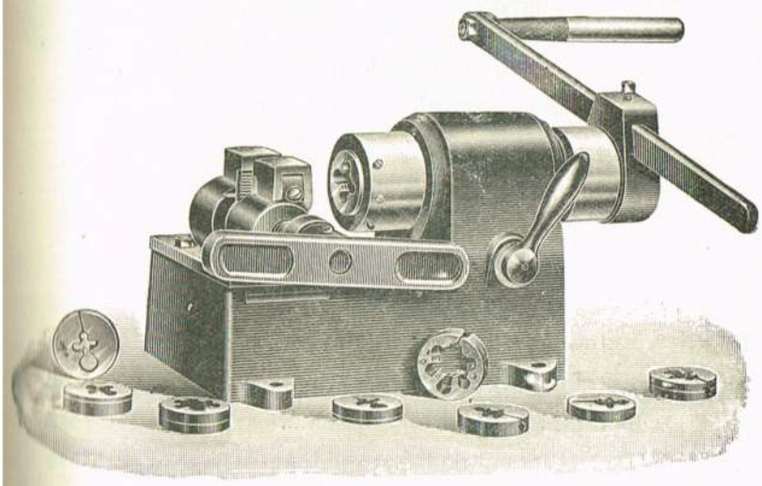


Fig. 83. No. 1.
HAND MACHINE FOR BOLTS AND TUBES.

The screwing machines listed are of excellent design. Manufactured from the finest materials. Full threads can be screwed once over only. Bends or springs can be held firmly in position. The vice is self-centering, and grips equally well round, square or hexagon, the jaws being tool steel hardened and tempered. The spindle is hollow, thus admitting any length to be screwed. Adjustable dies are provided. B.S.F., metric, left-hand, etc., dies can be supplied.

PRICES.

Complete machine with the following dies :

Whitworth ¼″, 5/16″, ⅜″, 7/16″, ½″, ⅝″, ¾″, ⅞″, 1″	**£10 0 0**
Ditto with gas dies, ⅛″, ¼″, ⅜″, ½″, ¾″, 1″	**£9 10 0**
Machine but no dies	**£7 0 0**

EXTRA DIES.

Size	⅛″	¼″	5/16″	⅜″	7/16″	½″	9/16″	⅝″	¾″	⅞″	1″	1¼″
Whitworth, B.S.F., S.A.E. threads	—	**6/6**	**6/6**	**6/6**	**6/6**	**6/6**	**7/–**	**7/–**	**7/–**	**7/6**	**7/6**	—
Gas threads	**6/6**	**6/6**	—	**6/6**	—	**7/–**	—	**7/–**	**8/–**	**19/–**	**19/–**	—
Electric conduit threads	—	—	—	—	—	**6/6**	—	**6/6**	**6/6**	**7/–**	**8/–**	**19/–**

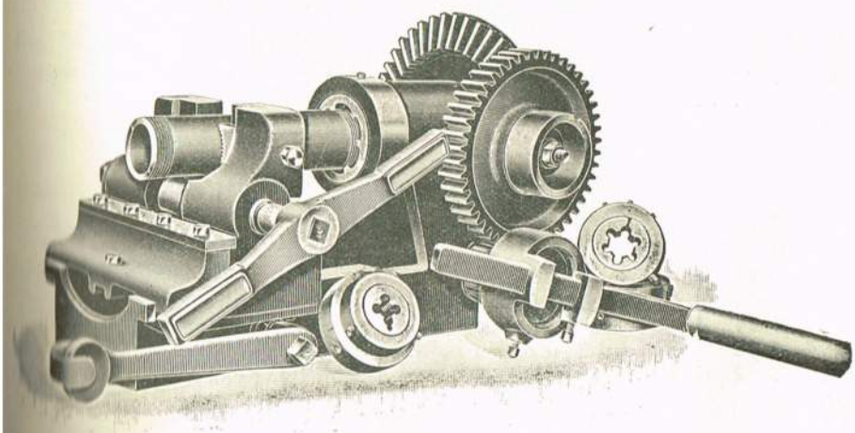


Fig. 83. No. 2.
HAND OR POWER FOR BOLTS AND TUBES.

A similarly constructed machine to No. 1, but heavier design for larger work. Provided with variable gear, giving a range of three speeds for hand and four speeds for power, with quick reverse on countershaft. A machine-cut rack and pinion is also fitted to vice. Will screw gas from ⅛″ to 2″, and bolts from ¼″ to 1½″.

PRICES AND PARTICULARS.

Hand machine only without dies but supplied with collets for dies	**£20 10 0**
Ditto for hand and power	**£25 0 0**
Extra for overhead countershaft with 2-speed cone, fast and loose and reverse pulleys	**£6 0 0**
Extra for cabinet stand with door and 2 shelves	**£6 0 0**

PRICE OF DIES.

Size	⅛″	3/16″	¼″	⅜″	7/16″	½″	9/16″	⅝″	¾″	⅞″	1″	1⅛″	1¼″	1⅜″	1½″	1¾″	2″
Gas, each	**6/6**	—	**6/6**	**6/6**	—	**7/–**	—	—	**8/–**	—	**10/–**	—	**20/–**	—	**20/–**	**30/–**	**30/–**
Bolt, each	—	**6/6**	**6/6**	**6/6**	**6/6**	**6/6**	**7/–**	**7/–**	**7/–**	**7/6**	**7/6**	**12/–**	**14/–**	**20/–**	**22/–**	—	—

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OSTER SCREWING MACHINES.

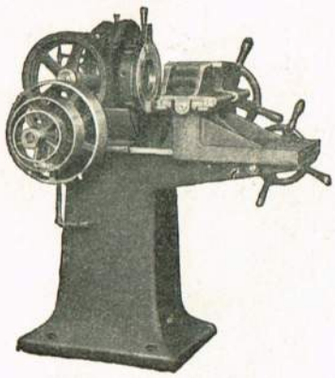

Fig. 84.

These machines perform every one of the many screwing jobs in ordinary use. Long, short, straight and bent, undersize and oversize, and nipples of any length. The lever-controlled die head is released and re-set instantly after the screw is finished, whilst the machine is in motion. The vice grips and centres the work by a single turn of the wheel. Dies may be changed without removing any part of the machine. These machines can be used as an ordinary hand die, except No. 308a, which is for threading long pieces of heavy pipe. One set of dies will screw two or more sizes of pipe. The oil is pumped by a geared pump direct by sprays on to the cutters on all sides, thereby washing away the chips. The oil is contained in a large reservoir.

PRICES AND SPECIFICATION.

Machine No. 300A. Belt driven.

Screwing from $\frac{1}{4}''$ to 2″ tubes, and bolts, $^7/_{16}''$ to $1\frac{1}{4}''$.

	£	s.	d.
Machine complete with countershaft, geared oil pump, automatic cut-off apparatus and die release ; complete with 4 sets of right-hand tube dies ($\frac{1}{4}$ and $\frac{3}{8}$), $\frac{1}{2}$ and $\frac{3}{4}$), (1 and $1\frac{1}{4}$), ($1\frac{1}{2}$, $1\frac{3}{4}$ and 2)	**65**	**12**	**6**
Extra dies, right or left (4 pieces), per set		**18**	**9**
Extra cutting-off blades, each		**4**	**2**
Bolt dies, per each size of bolt		**18**	**9**
Deduct for cut-off if not wanted	**7**	**16**	**3**
Deduct for automatic die release	**3**	**2**	**6**

This machine will screw bolts $^7/_{16}''$ to $1\frac{1}{4}''$ (8 sets dies).

Power for driving, $\frac{3}{4}$-h.p. engine or motor ample.

This machine can be operated by hand power without change of equipment.

Weight of machine, 800 lbs. nett ; 1100 lbs. gross.

Machine No. 306A. Belt driven.

Screwing from $1\frac{1}{4}''$ to 6″ tubes, and bolts $\frac{3}{4}''$ to 2″.

	£	s.	d.
Machine complete with countershaft, geared oil pump, automatic cut-off apparatus, automatic die release, tube rest stand and 6 sets right-hand tube dies ($1\frac{1}{4}$), ($1\frac{1}{2}$, $1\frac{3}{4}$ and 2), ($2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$ and 3), ($3\frac{1}{2}$ and 4), ($4\frac{1}{2}$ and 5), (6)	**137**	**10**	**0**
Add for 1″ size of tube	**3**	**2**	**6**
Extra dies, right or left (2 sizes of tubes) per set	**1**	**11**	**3**
Extra cutting-off blades, each		**4**	**2**
Bolt dies, right or left, per each size of bolts	**1**	**11**	**3**
Deduct for automatic die release	**4**	**13**	**9**
Extra vice jaws for $1\frac{5}{8}''$ bolts and under	**3**	**2**	**6**

This machine will screw bolts all sizes, $\frac{3}{4}''$ to 2″ (11 sets dies).

This machine will be supplied on order with a die head with 6 dies instead of 4, by the addition of **£15 12 6** to the regular list price.

Power for driving, $1\frac{3}{4}$-h.p. engine or motor ample.

Weight of machine, 2000 lbs. nett ; 2400 lbs. gross.

Machine No. 304A. Belt driven.

Screwing from 1″ to 4″ tubes, and bolts $\frac{1}{2}''$ to $1\frac{5}{8}''$.

	£	s.	d.
Machine complete with countershaft, geared oil pump, automatic cut-off apparatus, automatic die release, tube rest stand and 4 sets of right-hand tube dies (1 and $1\frac{1}{4}$), ($1\frac{1}{2}$, $1\frac{3}{4}$ and 2), ($2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$ and 3), ($3\frac{1}{2}$ and 4)	**98**	**19**	**2**
Add for $\frac{1}{2}''$ and $\frac{3}{4}''$ sizes of tube	**3**	**2**	**6**
Extra dies, right or left (4 pieces), per set	**1**	**5**	**0**
Extra cutting-off blades, each		**4**	**2**
Bolt dies, per each size of bolt....	**1**	**5**	**0**
Deduct for cut-off if not wanted	**7**	**16**	**3**
Deduct for automatic die release	**4**	**13**	**9**
Extra vice jaws for 1″ bolts and under	**2**	**5**	**10**

This machine will screw bolts $\frac{1}{2}''$ to $1\frac{5}{8}''$ (10 sets dies).

Power for driving, $1\frac{1}{2}$-h.p. engine or motor ample.

This machine can be operated by hand power without change of equipment.

Weight of machine, 1400 lbs. nett ; 1625 lbs. gross.

Machine No. 308A. Belt driven.

Screwing from $2\frac{1}{2}''$ to 8″ tubes.

	£	s.	d.
Machine complete with countershaft, geared oil-pump, automatic cut-off apparatus and 6 sets right-hand tube dies ($2\frac{1}{2}$ and 3), ($3\frac{1}{2}$ and 4), ($4\frac{1}{2}$ and 5), (6), (7), (8)....	**250**	**0**	**0**
Extra dies, per single set, right or left (6 pieces)	**3**	**2**	**6**
Extra cutting-off blade		**8**	**4**

Weight of machine, 4000 lbs. nett ; 4700 lbs. gross.

$2\frac{1}{2}$-h.p. engine or motor ample power for driving.

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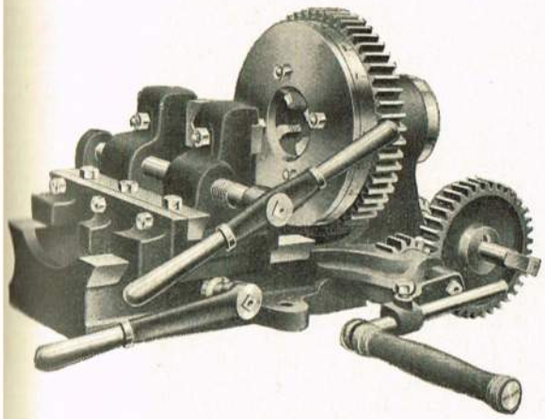
SCREWING MACHINES.

Fig. 85.

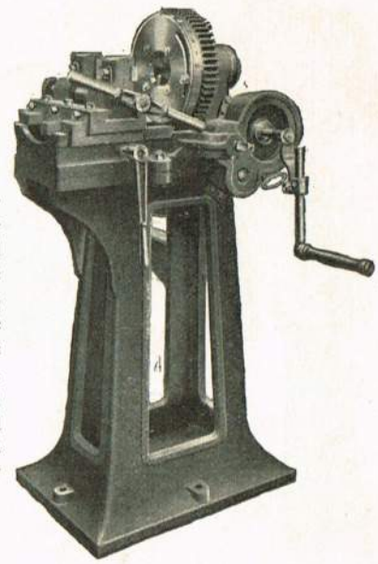
"UNIVERSAL" SCREWING MACHINE FOR HAND AND POWER.

2″ pipe.



Machine without stand.

Fitted with chaser type interchangeable dies. Manufactured from high-grade steel. The general specification of this machine is the same as for the 3″ and 4″ sizes listed on page 22, but there is no trough. Countershaft is supplied at an extra cost. Guards are supplied on the 2″ machine. Two speeds are provided for working by hand.



With stand to floor.

SPECIFICATION AND PRICES.

	Hand and power on stand. £ s. d.	Hand drive bench machine £ s. d.
No. 19UV Screwing Machine, on cast iron stand, to work either by hand or power, to screw $\frac{1}{4}$″, $\frac{3}{8}$″, $\frac{1}{2}$″, $\frac{3}{4}$″, 1″, $1\frac{1}{4}$″, $1\frac{1}{2}$″, $1\frac{3}{4}$″, 2″ pipes, with fast and slow speeds for small and large sizes	**43 0 0**	**30 0 0**
No. 20 UV Screwing Machine,, to screw $\frac{1}{2}$″, $\frac{3}{4}$″, 1″, $1\frac{1}{4}$″, $1\frac{1}{2}$″, $1\frac{3}{4}$″, 2″ pipes	**40 10 0**	**27 10 0**
No. 21UV Screwing Machine, to screw 1″, $1\frac{1}{4}$″, $1\frac{1}{2}$″, $1\frac{3}{4}$″, 2″ pipes	**38 0 0**	**25 0 0**
No. 22 UV Screwing Machine, to screw $\frac{1}{4}$″, $\frac{3}{8}$″, $\frac{1}{2}$″, $\frac{3}{4}$″, 1″, $1\frac{1}{4}$″, $1\frac{1}{2}$″, $1\frac{3}{4}$″, 2″ pipes, and $\frac{1}{4}$″, $\frac{3}{8}$″, $\frac{1}{2}$″, $\frac{5}{8}$″, $\frac{7}{8}$″, 1″, $1\frac{1}{8}$″, $1\frac{1}{4}$″ bolts	**59 0 0**	**46 0 0**
No. 23UV Screwing Machine, to screw $\frac{1}{4}$″, $\frac{3}{8}$″, $\frac{1}{2}$″, $\frac{3}{4}$″, 1″, $1\frac{1}{4}$″, $1\frac{1}{2}$″, $1\frac{3}{4}$″, 2″ pipes, and $\frac{1}{2}$″, $\frac{5}{8}$″, $\frac{3}{4}$″, $\frac{7}{8}$″, 1″, $1\frac{1}{8}$″, $1\frac{1}{4}$″ bolts	**55 0 0**	**42 0 0**
No. 24 UV Screwing Machine, to screw $\frac{1}{4}$″, $\frac{3}{8}$″, $\frac{1}{2}$″, $\frac{3}{4}$″, 1″, $1\frac{1}{4}$″, $1\frac{1}{2}$, $1\frac{3}{4}$″, 2″ pipes, and $\frac{1}{2}$″, $\frac{5}{8}$″, $\frac{3}{4}$″, $\frac{7}{8}$″, 1″, $1\frac{1}{8}$″, $1\frac{1}{4}$″, $1\frac{3}{8}$″, $1\frac{1}{2}$″ bolts	**57 0 0**	**44 0 0**
Dies for either pipes or bolts .... per set	**2 0 0**	**2 0 0**
Cutting-off apparatus (ordinary) .... extra	**3 0 0**	**3 0 0**
Cutting-off apparatus (self-feeding) .... extra	**5 10 0**	**5 10 0**
Overhead driving apparatus .... extra	**9 10 0**	—
Cast iron stand .... extra	—	**6 0 0**
Fitted to work by power .... extra	—	**7 0 0**

Dies can be supplied for screwing hydraulic tubes right and left-hand, also square threads.

Approximate weight of power machine on stand, $5\frac{1}{4}$ cwts. ; Bench machine, $2\frac{1}{4}$ cwts.

Dimensions of case—2 ft. 8 in. × 2 ft. 10 in. × 4 ft. 4 in.

Driving pulleys—12 in. diam. × $3\frac{1}{8}$ in. wide. Speed of driving pulleys—300 revolutions per minute.

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UNIVERSAL SCREWING MACHINES.

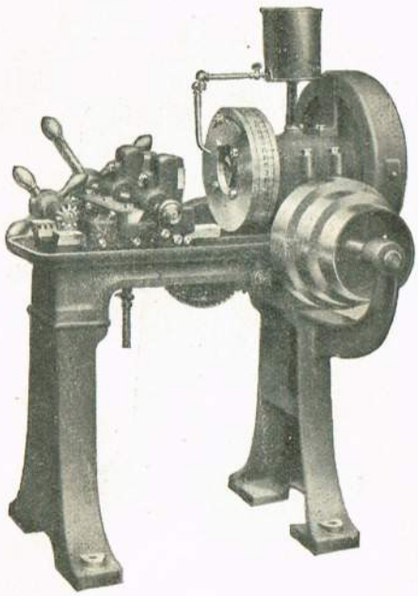

Fig. 86. HAND AND POWER. 3″ and 4″ Types.

DESCRIPTION.

The bed is of heavy box type, deep section, and the headstock is cast integrant with it. It forms a well for collecting the lubricant used when screwing, from which it can be withdrawn for re-use.

The head, and main spindle which is hollow, are cast in one piece. It has a multi-throw cam or incline, which enables the screwing dies to be released and the work withdrawn, thus obviating the necessity of reversing the machine.

The dies, which are absolutely interchangeable, are of the chaser type, four to a set in the machines up to and including 4″, above this size up to 6″, six to a set, and above this size up to 8″, eight to a set. They are made from high-grade steel, are accurately ground to size, and have the requisite amount of clearance.

Adjustment.—The die head is provided with an index so that the dies can be set quickly and accurately to the correct size. Each set of dies will screw a number of sizes, thus obviating the constant changing of dies from one set to another.

The vice is of the open-jaw self-centring type, and travels right up to the head, thus enabling bends and short tubes, as well as ordinary straight tubes, to be dealt with, and also irregular-shaped bolts. The vice blocks are operated by means of a right and left-hand square thread steel screw of large diameter. A cross handle of large size is fitted, thus giving ease of manipulation.

Cone pulley.—A three-speed cone pulley is fitted to all machines except the 2″ size, on which fast and loose pulleys are usually supplied unless ordered to the contrary.

Countershaft, consisting of hangers, countershaft, cone pulley, fast and loose pulleys, and belt-shifting gear is supplied on all machines 3″ size and upwards. Countershaft can also be supplied for the 2″ size machine at an extra charge.

Extra gear wheels are supplied in the 3″ size machine and larger, for increasing the speed when screwing the small sizes, either by hand or power.

Two-speed hand gear.—On all machines two speeds are available when working by hand without the use of extra gear wheels. Using the extra gear wheels three speeds are available by hand on the 3″ size machines and larger.

Spindle speeds.—Owing to the unique design of these machines, twelve different cutting speeds are available by belt power on the 3″ size machines and larger; hence all sizes within the capacity of the machines can be dealt with to equal and the best advantage.

SPECIFICATION AND PRICES.

	Hand and power drive £ s. d.	Hand drive £ s. d.
No. 35 Improved Screwing Machine, as per illustration, mounted on iron standards or legs, to work either by hand or power, and fitted with three-speed cone pulley for driving, with dies for screwing ¼″, ⅜″, ½″, ¾″, 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″ Pipes, with extra pair of wheels for increasing the speed when screwing the small sizes; overhead driving apparatus, can and stand for lubricant, screw-keys, etc., complete	100 0 0	70 0 0
No. 36 Improved Screwing Machine, as above, with dies for screwing ½″, ¾″, 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″ pipes, with extra pair of wheels, overhead driving apparatus, etc., complete	95 0 0	65 0 0
No. 37 Improved Screwing Machine, as above, with dies for screwing 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″ pipes, with extra pair of wheels, overhead driving apparatus, etc., complete	90 0 0	60 0 0
No. 38 Improved Screwing Machine, as above, with dies for screwing ½″, ¾″, 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″ pipes, and ½″, ⅝″, ¾″, ⅞″, 1″, 1⅛″, 1¼″, 1⅜″, 1½″ bolts, Whitworth thread, with extra pair of wheels, overhead driving apparatus, etc., complete	118 0 0	88 0 0
No. 39 Improved Screwing Machine, as above, with dies for screwing ½″, ¾″, 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″ pipes, and ½″, ⅝″, ¾″, ⅞″, 1″, 1⅛″, 1¼″, 1⅜″, 1½″, 1⅝″, 1¾″, 1⅞″, 2″ bolts, Whitworth thread, with extra pair of wheels, overhead driving apparatus, etc., ...	124 0 0	94 0 0
No. 40 Improved Screwing Machine, as above, mounted on iron standards or legs, to work either by hand or power, and fitted with three-speed cone pulley for driving, with dies for screwing ½″, ¾″, 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″, 3¼″, 3½″, 3¾″, 4″ pipes, with extra pair of wheels for increasing the speed when screwing the small sizes. Overhead driving apparatus, can and stand for lubricant, screw-keys, etc., complete	110 0 0	80 0 0
No. 41 Improved Screwing Machine, as above, with dies for screwing 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″, 3¼″, 3½″, 3¾″, 4″ pipes, with extra pair of wheels, overhead driving apparatus, etc., complete	105 0 0	75 0 0
No. 42 Improved Screwing Machine, as above, with dies for screwing 2″, 2¼″, 2½″, 2¾″, 3″, 3¼″, 3½″, 3¾″, 4″ pipes, with extra pair of wheels, overhead driving apparatus, etc., complete	100 0 0	70 0 0
No. 43 Improved Screwing Machine, as above, with dies for screwing 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″, 3¼″, 3½″, 3¾″, 4″ pipes, and ½″, ⅝″, ¾″, ⅞″, 1″, 1⅛″, 1¼″, 1⅜″, 1½″ bolts, Whitworth thread, with extra pair of wheels, overhead driving apparatus, etc., complete	128 0 0	98 0 0
No. 44 Improved Screwing Machine, as above, with dies for screwing 1″, 1¼″, 1½″, 1¾″, 2″, 2¼″, 2½″, 2¾″, 3″, 3¼″, 3½″, 3¾″, 4″ pipes, and ½″, ⅝″, ¾″, ⅞″, 1″, 1⅛″, 1¼″, 1⅜″, 1½″, 1⅝″, 1¾″, 1⅞″, 2″ bolts, Whitworth thread, with extra pair of wheels, overhead driving apparatus, etc.	134 0 0	104 0 0
Dies for either pipes or bolts .... per set	3 0 0	
Cutting-off apparatus (ordinary) .... extra	5 10 0	
Cutting-off apparatus (self-feeding) .... extra	9 0 0	

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CHASERS.

Inside Hand Chasers.

Outside Hand Chasers.

Fig. 87. WHITWORTH FORM. Angle 55%.

Threads per inch ...	60	48	40	32	28	26	24	22	20	19	18	16
Price per pair ...	3/–	2/6	1/9	1/9	1/9	1/9	1/9	1/9	1/9	1/9	1/9	1/9
Threads per inch	14	12	11	10	9	8	7	6	5	4½	4	3½	3
Price per pair	1/9	1/9	1/9	2/3	2/3	3/–	3/–	3/–	3/9	3/9	3/9	3/9	3/9

Fig. 88. BRITISH ASSOCIATION THREADS. Angle 47½%.

Number, B.A.	0	1	2	3	4	5	6	7	8	9	10
Pitch of thread, m/m	1	0.9	0.81	0.73	0.66	0.59	0.53	0.48	0.43	0.39	0.35
Price per pair	3/–	3/–	3/–	3/–	3/–	3/–	3/–	3/–	3/–	3/–	3/–

Fig. 89. INTERNATIONAL STANDARD. METRIC THREAD. (S.I.) Angle 60%.

Diameter, m/m. ...	68–64	60–56	52–48	45–42	39–36	33–30	27–24	22–18	16–14	12
Pitch of thread, m/m.	6	5.5	5	4.5	4	3.5	3	2.5	2	1.75
Price per pair ...	4/6	4/6	4/6	3/6	3/6	3/6	2/9	2/9	2/3	2/3
Diameter, m/m. ...	11–10	9.8	7.6	—	—	—	—	—	—	—
Pitch of thread, m/m.	1.5	1.25	1	.9	.85	.75	.7	.6	.55	.5
Price per pair ...	2/3	2/3	2/3	2/9	2/9	2/9	2/9	2/9	2/9	2/9

Fig. 90. Inside Machine Chasers.

Fig. 91. Outside Machine Chasers.

Threads per inch	60	48	40	32	28	26	24	22	20	19	18	16	14	12
Size of square shanks, inches	½	⅝					½			⅝				
Price per pair	7/6	9/6					6/–			8/–				
Price each—Outside	3/3	4/3					2/8			3/6				
„ Inside	4/3	5/3					3/4			4/6				

Threads per inch	11	10	9	8	7	6	6	5	4½	4	3½
Size of square shanks, inches ...	½	⅝	⅝	⅝	¾	⅝	¾	¾	¾	¾	¾
Price per pair	6/–	8/–	8/6	8/6	10/6	8/6	12/–	12/–	12/–	15/–	15/–
Price each—Outside	2/8	3/6	3/9	3/9	4/9	3/9	5/3	5/3	5/3	6/6	6/6
„ Inside	3/4	4/6	4/9	4/9	5/9	4/9	6/9	6/9	6/9	8/6	8/6

We can supply Hand and Machine Chasers for all forms of thread to order at special prices.
Prices of Chasers in High-Speed Steel upon application.

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TAP WRENCHES.

DOUBLE-HANDLED.

Fig. 92. For Engineers' Taps.

Tap Sizes	Each	Tap sizes	Each
3/16″ 1/4″	6/–	7/8″ 1″	16/6
1/4″ 5/16″ 3/8″	6/6	3/4″ 7/8″ 1″	16/6
1/4″ 3/8″ 1/2″	8/–	1″ 1 1/8″ 1 1/4″	22/–
1/4″ 5/16″ 3/8″ 7/16″ 1/2″	8/–	1 1/4″ 1 3/8″ 1 1/2″	31/6
1/2″ 5/8″	10/6	1 1/2″ 1 5/8″ 1 3/4″	41/–
5/8″ 3/4″	13/–	1 3/4″ 1 7/8″ 2″	52/–
1/2″ 5/8″ 3/4″	13/–	2″ 2 1/4″	60/–
5/8″ 3/4″ 7/8″	15/–	2 1/4″ 2 1/2″	68/6
		2 1/2″ 3″	78/–

Fig. 93. For Iron Gas Taps.

Tap sizes	Each	Tap sizes	Each
1/8″ 1/4″	8/–	1″ 1 1/4″ 1 1/2″	41/–
1/8″ 1/4″ 3/8″	10/6	1 1/4″ 1 1/2″ 2″	55/–
1/4″ 3/8″ 1/2″	13/–	1 1/2″ 1 3/4″ 2″ 2 1/4″	60/–
3/8″ 1/2″ 5/8″	16/6	2 1/4″ 2 1/2″	68/6
3/8″ 1/2″ 3/4″	16/6	2 1/2″ 3″	78/6
1/2″ 3/4″ 1″	22/–	3 1/4″ 3 1/2″	130/–
3/4″ 1″ 1 1/4″	31/6	3 1/2″ 4″	150/–

Fig. 94.

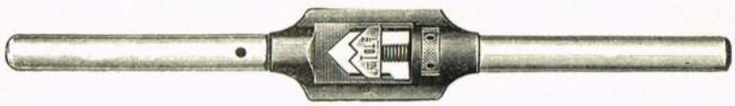
TAP WRENCH FOR ENGINEERS' USE.

Single-handed.

1/4″	5/16″	3/8″	
3/3	3/6	3/9	
7/16″	1/2″	5/8″	
4/–	4/6	5/–	
3/4″	7/8″	1″	
6/–	7/6	9/–	
1 1/8″	1 1/4″	1 3/8″	1 1/2″
11/–	13/–	18/–	23/–

Fig. 95. NEW PATTERN ADJUSTABLE TAP AND REAMER WRENCHES.

A useful tool designed for hard work. The No. 1, 2 and 3 sizes have the adjusting screws independent of the handle, and when used for hard tapping work they do not loosen as do wrenches having one handle used for adjustment. The handles are screwed into the body; one of them is holed so that it can be removed with a tommy bar, the tool may then be used in confined spaces as a single-handed wrench.



	No. 0	No. 1	No. 2	No. 3
For taps	1/16″ to 1/4″	3/16″ to 1/2″	1/4″ to 3/4″	1/2″ to 1″
Price	16/–	24/6	30/	38/–

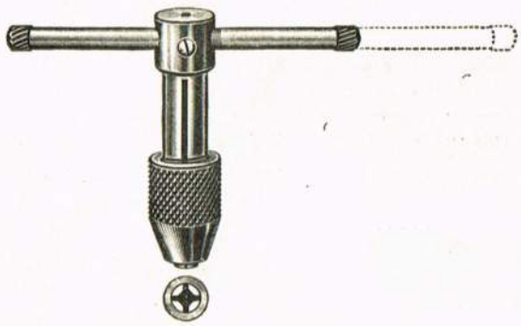


Fig. 96.

This tool is designed for holding taps, reamers, small drills, or other small tools. It is superior to similar wrenches because of its slide handle, which permits its use in many places where a rigid handle cannot be turned.

For ordinary work handle can be set rigid by means of a set screw.

Chuck shell is knurled. Jaws are tempered, sleeve is case-hardened. Centres accurately.

No.	Length of handle	Capacity	Price each
10	3 1/4″	Up to 1/4″	1/6
11	4 3/4″	Up to 3/8″	1/11
12	5 1/4″	Up to 1/2″	2/9

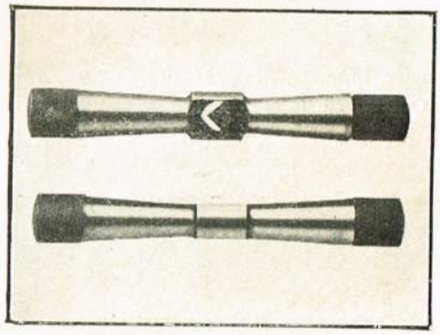


Fig. 97. TAP WRENCH.

Well made in steel, ground all over, fitted with hardened screws, and knurled both ends.

Length 3 1/2″. Taps up to 1/4″.

Price ... **1/2** each.

Fig. 98. TAP WRENCH.

Length	Takes up to	Price
8″	3/8″	3/–
10″	1/2″	3/6

A thoroughly reliable tap wrench constructed to withstand hard wear and tear. Knurled at ends.

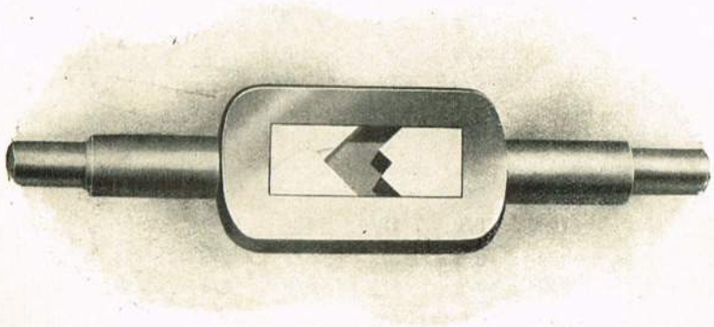


Fig. 99. Very practical tool of great strength and rigid design.

PRICES AND PARTICULARS OF Fig. 99.

			Each
No. 0 to take taps 1/16″ to 5/16″	...	8″ long	... 7/–
No. 1 to take taps 3/16″ to 1/2″	...	12″ long	... 9/9
No. 2 to take taps 3/16″ to 3/4″	...	17″ long	... 15/–
No. 3 to take taps 1/4″ to 1″	...	20″ long	... 18/9
No. 4 to take taps 3/8″ to 1 1/2″	...	28″ long	... 35/6

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TWIST DRILLS. HIGH SPEED AND CARBON.

Fig. 100. Jobbers' Lengths. **English Sizes.** Straight Shanks.

Diameter inches	Approx. length inches	Price per doz. High Speed	Price per doz. Carbon	Diameter inches	Approx. length inches	Price per doz. High Speed	Price per doz. Carbon	Diameter inches	Approx. length	Price per doz. High speed	Price per doz. Carbon
1/32	1 7/16	—	6/3	3/16	3½	21/–	9/5	11/32	4¾	45/–	21/1
3/64	1 11/16	—	6/6	13/64	3¾	23/–	10/5	27/64	5	48/–	22/11
1/16	2	14/–	6/8	7/32	3¾	24/–	11/6	3/8	5	51/–	25/–
5/64	2¼	15/–	6/11	15/64	4	27/–	12/6	25/64	5¼	54/–	27/1
3/32	2½	16/–	7/1	¼	4	29/–	13/7	13/32	5¼	57/–	29/2
7/64	2½	16/–	7/4	17/64	4¼	31/–	14/7	27/64	5½	60/–	32/4
⅛	2¾	17/–	7/6	9/32	4¼	33/–	15/10	7/16	5½	60/–	36/5
9/64	3	18/–	7/9	19/64	4¼	36/–	16/8	29/64	5¾	63/–	38/7
5/32	3¼	19/–	7/11	5/16	4½	39/–	18/2	15/32	5¾	66/–	41/8
11/64	3¼	20/–	8/4	21/64	4¾	42/–	19/7	31/64	6	69/–	45/10
								½	6	72/–	50/–

Fig. 101. Jobbers' Lengths. **Metric Sizes.** Straight Shanks.

Diam. millimetres	Decimal equivalent	Approx. length, millimetres	Price per dozen. High Speed	Price per dozen. Carbon	Diam. millimetres	Decimal equivalent	Approx. length, millimetres	Price per dozen. High Speed	Price per dozen. Carbon
1	·0393	41	—	6/3	7·5	·2953	108	36/–	16/8
1·5	·0590	44	—	6/8	8	·3149	114	39/–	18/9
2	·0787	57	15/–	6/11	8·5	·3346	121	42/–	20/10
2·5	·0984	64	16/–	7/1	9	·3543	121	45/–	22/11
3	·1181	70	17/–	7/1	9·5	·3740	127	51/–	25/–
3·5	·1378	76	18/–	7/6	10	·3937	133	54/–	27/1
4	·1575	82	19/–	7/11	10·5	·4134	133	57/–	30/3
4·5	·1771	89	21/–	8/4	11	·4330	140	60/–	33/4
5	·1968	89	22/–	9/5	11·5	·4527	146	63/–	37/6
5·5	·2165	95	24/–	10/10	12	·4724	146	66/–	41/8
6	·2362	101	27/–	12/4	12·5	·4921	152	72/–	45/10
6·5	·2559	101	29/–	13/9	13	·5118	152	75/–	52/1
7	·2756	108	33/–	15/3					

Fig. 102. Jobbers' Lengths. **Letter Sizes.** Straight Shanks.

Letter.	Length inches.	Decimal inches.	Price per doz. High Speed.	Price per doz. Carbon.	Letter.	Length inches.	Decimal inches.	Price per doz. High Speed.	Price per doz. Carbon.	Letter.	Length inches.	Decimal inches.	Price per doz. High Speed.	Price per doz. Carbon.
A	4	·2340	27/–	12/6	J	4¼	·2770	33/–	15/6	S	4¾	·3480	45/–	21/6
B	4	·2380	27/–	12/9	K	4¼	·2811	33/–	16/–	T	5	·3580	48/–	22/3
C	4	·2420	27/–	13/–	L	4¼	·2900	36/–	16/3	U	5	·3680	48/–	23/–
D	4	·2460	27/–	13/3	M	4¼	·2950	36/–	16/9	V	5	·3770	51/–	25/–
E	4	·2500	29/–	13/6	N	4½	·3020	39/–	17/9	W	5¼	·3860	54/–	27/–
F	4	·2570	29/–	14/–	O	4½	·3160	39/–	18/6	X	5¼	·3970	54/–	28/3
G	4¼	·2610	31/–	14/6	P	4½	·3230	39/–	19/3	Y	5¼	·4040	57/–	29/3
H	4¼	·2660	31/–	14/9	Q	4¾	·3320	42/–	19/9	Z	5¼	·4130	57/–	30/–
I	4¼	·2720	31/–	15/3	R	4¾	·3390	42/–	21/–					

Fig. 103. Jobbers' Lengths. **Wire Gauge Sizes.** Straight Shanks.

Gauge	Decimal inches.	Length inches.	Price per doz. High Speed.	Price per doz. Carbon.	Gauge	Decimal inches.	Length inches.	Price per doz. High Speed.	Price per doz. Carbon.	Gauge	Decimal inches.	Length inches.	Price per doz. High Speed.	Price per doz. Carbon.
1	·2280	3¾	24/–	11/6	21	·1590	3¼	19/–	8/–	41	·0960	2½	16/–	7/–
2	·2210	3¾	24/–	11/6	22	·1570	3¼	19/–	8/–	42	·0935	2½	16/–	7/–
3	·2130	3¾	23/–	11/6	23	·1540	3¼	19/–	8/–	43	·0890	2¼	15/–	7/–
4	·2090	3¾	23/–	11/6	24	·1520	3¼	19/–	8/–	44	·0860	2¼	15/–	7/–
5	·2055	3¾	23/–	11/6	25	·1495	3	18/–	7/6	45	·0820	2¼	15/–	7/–
6	·2040	3¾	23/–	10/6	26	·1470	3	18/–	7/6	46	·0810	2¼	15/–	7/–
7	·2010	3½	22/–	10/6	27	·1440	3	18/–	7/6	47	·0785	2¼	15/–	7/–
8	·1990	3½	22/–	10/6	28	·1405	3	18/–	7/6	48	·0760	2¼	15/–	7/–
9	·1960	3½	22/–	10/6	29	·1360	3	18/–	7/6	49	·0730	2	14/–	7/–
10	·1935	3½	22/–	10/6	30	·1285	2¾	17/–	7/3	50	·0700	2	14/–	7/–
11	·1910	3½	22/–	9/6	31	·1200	2¾	17/–	7/3	51	·0670	2	14/–	6/9
12	·1890	3½	21/–	9/6	32	·1160	2¾	17/–	7/3	52	·0635	2	14/–	6/9
13	·1850	3½	21/–	9/6	33	·1130	2½	16/–	7/3	53	·0595	1¾	13/–	6/9
14	·1820	3½	21/–	9/6	34	·1110	2½	16/–	7/3	54	·0550	1¾	13/–	6/9
15	·1800	3½	21/–	9/6	35	·1100	2½	16/–	7/3	55	·0520	1¾	13/–	6/9
16	·1770	3½	21/–	8/3	36	·1065	2½	16/–	7/3	56	·0465	1¾	13/–	6/6
17	·1730	3¼	20/–	8/3	37	·1040	2½	16/–	7/3	57	·0430	1⅝	13/–	6/6
18	·1695	3¼	20/–	8/3	83	·1015	2½	16/–	7/3	58	·0420	1⅝	13/–	6/6
19	·1660	3¼	20/–	8/3	39	·0995	2½	16/–	7/3	59	·0410	1⅝	13/–	6/6
20	·1610	3¼	19/–	8/3	40	·0980	2½	16/–	7/3	60	·0400	1⅝	13/–	6/6

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TWIST DRILLS, HIGH SPEED AND CARBON.

MORSE TAPER OR STRAIGHT SHANKS.

LONG SERIES.
ENGLISH SIZES.

Straight Shank.
Fig. 104.

Taper Shank.
Fig. 105.

Diameter Inches	Decimal Equivalent	Length Inches	Price each High Speed	Price each Carbon
No. 1 Shank.				
1/16	·0625	4 3/8	—	1/11
5/64	·0781	4 1/2	—	1/11
3/32	·0937	4 1/2	—	1/11
7/64	·1093	4 5/8	—	1/11
1/8	·125	5 1/8	5/6	1/11
9/64	·1406	5 1/4	5/6	1/11
5/32	·1562	5 3/8	5/6	1/11
11/64	·1718	5 1/2	5/6	2/1
3/16	·1875	5 3/4	5/9	2/1
13/64	·2031	5 7/8	5/9	2/4
7/32	·2187	6	5/9	2/4
15/64	·2343	6 1/8	5/9	2/6
1/4	·2500	6 1/8	6/–	2/6
17/64	·2656	6 1/4	6/3	2/9
9/32	·2812	6 1/4	6/3	2/9
19/64	·2968	6 3/8	6/3	2/11
5/16	·3125	6 3/8	6/3	2/11
21/64	·3281	6 1/2	6/6	3/2
11/32	·3437	6 1/2	6/6	3/2
23/64	·3593	6 3/4	6/6	3/4
3/8	·3750	6 3/4	6/6	3/4
25/64	·3906	7	7/–	3/9
13/32	·4063	7	7/–	3/9
27/64	·4218	7 1/4	7/6	4/2
7/16	·4375	7 1/4	7/6	4/2
29/64	·4531	7 1/2	8/–	4/7
15/32	·4688	7 1/2	8/–	4/7
31/64	·4843	7 3/4	8/6	5/–
1/2	·5000	7 3/4	8/6	5/–
33/64	·5156	8	9/–	5/5
1/52	·5312	8	9/–	5/5
35/64	·5068	8 1/4	9/–	5/10
9/16	·5625	8 1/4	10/–	5/10
37/64	·5781	8 1/2	10/–	6/3
19/32	·5937	8 1/2	11/–	6/3
No. 2 Shank.				
*9/16	.5625	8 1/4	12/–	—
*37/64	·5781	8 1/2	12/–	—
*19/32	·5937	8 1/2	12/6	—
39/64	·6093	8 3/4	13/–	6/8
5/8	·6250	8 3/4	13/–	6/8
41/64	·6406	9	13/6	7/1
21/32	·6562	9	13/6	7/1
43/64	·6718	9 1/4	14/–	7/6
11/16	·6875	9 1/4	14/–	7/6
45/64	·7031	9 1/2	15/–	7/11
23/32	·7187	9 1/2	15/–	7/11
47/64	·7343	9 3/4	16/–	8/4
3/4	·7500	9 3/4	16/–	8/4
49/64	·7656	9 7/8	17/–	8/9
25/32	·7812	9 7/8	17/–	8/9
51/64	·7968	10	18/–	9/2
13/16	·8125	10	18/–	9/2
53/64	·8281	10 1/4	19/–	10/–
27/32	·8437	10 1/4	19/–	10/–
55/64	·8593	10 1/2	20/6	10/10
7/8	·8750	10 1/2	20/6	10/10
57/64	·8906	10 5/8	22/–	11/8
29/32	·9062	10 5/8	22/–	11/8
No. 3 Shank.				
59/64	·9218	10 3/4	23/6	12/6
15/16	·9375	10 3/4	23/6	12/6
61/64	·9531	10 7/8	25/–	13/7
31/32	·9687	10 7/8	25/–	13/7
63/64	·9843	11	26/6	14/7
1	1·000	11	26/6	14/7
1 1/64	1·016	11 1/8	28/–	15/8
1 1/32	1·031	11 1/8	29/–	15/8
1 3/64	1·047	11 1/4	30/–	16/8
1 1/16	1·063	11 1/4	31/–	16/8

Diameter Inches	Decimal Equivalent	Length Inches	Price each High Speed	Price each Carbon
No. 3 Shank.				
1 5/64	1·078	11 1/2	32/–	17/9
1 3/32	1·094	11 1/2	33/–	17/9
1 7/64	1·109	11 3/4	34/–	18/9
1 1/8	1·125	11 3/4	35/–	18/9
1 9/64	1·140	11 7/8	36/–	19/10
1 5/32	1·156	11 7/8	37/–	19/10
1 11/64	1·171	12	38/–	20/10
1 3/16	1·187	12	39/–	20/10
1 13/64	1·203	12 1/8	41/–	21/11
1 7/32	1·218	12 1/8	42/–	21/11
1 15/64	1·234	12 1/2	42/–	22/11
1 1/4	1·250	12 1/2	44/–	22/11
No. 4 Shank.				
1 17/64	1·266	14 1/8	52/–	24/–
1 9/32	1·281	14 1/8	53/–	24/–
1 19/64	1·297	14 1/4	54/–	25/–
1 5/16	1·313	14 1/4	55/–	25/–
1 21/64	1·328	14 3/8	57/–	26/1
1 11/32	1·344	14 3/8	58/–	26/1
1 23/64	1·359	14 1/2	60/–	27/1
1 3/8	1·375	14 1/2	62/–	27/1
1 25/64	1·391	14 5/8	63/–	29/2
1 13/32	1·406	14 5/8	64/–	29/2
1 27/64	1·422	14 3/4	66/–	31/3
1 7/16	1·438	14 3/4	68/–	31/3
1 29/64	1·453	14 7/8	70/–	33/4
1 15/32	1·468	14 7/8	72/–	33/4
1 31/64	1·484	15	74/–	35/5
1 1/2	1·500	15	76/–	35/5
1 33/64	1·516	15	78/–	37/6
1 17/32	1·531	15	80/–	37/6
1 35/64	1·547	15 1/4	82/–	39/7
1 9/16	1·562	15 1/4	84/–	39/7
1 37/64	1·578	15 1/4	86/–	41/8
1 19/32	1·594	15 1/4	88/–	41/8
1 39/64	1·609	15 1/2	90/–	43/9
1 5/8	1·625	15 1/2	92/–	43/9
1 21/32	1·656	15 1/2	95/–	45/10
1 11/16	1·688	15 3/4	98/–	47/11
1 23/32	1·719	15 3/4	101/–	50/–
1 3/4	1·750	16	104/–	52/1
1 25/32	1·781	16	108/–	55/3
1 13/16	1·831	16 1/4	112/–	58/4
1 27/32	1·849	16 1/4	116/–	61/6
1 7/8	1·875	16 1/2	120/–	64/7
1 29/32	1·906	16 1/2	125/–	67/9
1 15/16	1·938	16 1/2	130/–	70/10
1 31/32	1·969	16 1/2	135/–	74/–
2	2·000	16 1/2	140/–	77/1
No. 5 Shank.				
2 1/32	2·031	17	152/–	80/3
2 1/16	2·062	17	155/–	83/4
2 3/32	2·094	17	160/–	86/6
2 1/8	2·125	17	165/–	89/7
2 5/32	2·156	17	170/–	92/10
2 3/16	2·187	17	175/–	95/10
2 7/32	2·219	17 1/2	180/–	99/–
2 1/4	2·250	17 1/2	185/–	102/1
2 5/16	2·312	17 1/2	195/–	108/4
2 3/8	2·375	18	210/–	114/7
2 7/16	2·438	18 1/2	225/–	120/10
2 1/2	2·500	19	240/–	127/1
2 9/16	2·562	19 1/4	260/–	133/4
2 5/8	2·625	19 1/2	275/–	141/8
2 11/16	2·687	20	295/–	150/–
2 3/4	2·750	20 1/2	315/–	158/4
2 13/16	2·812	20 1/2	335/–	168/9
2 7/8	2·875	21	355/–	179/2
2 15/16	2·937	21	375/–	189/7
3	3·000	22	400/–	200/–

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TWIST DRILLS – HIGH SPEED AND CARBON

Fig. 106 Straight Shank

Fig. 107. Taper Shank.

MORSE TAPER or STRAIGHT SHANK. Long Series. METRIC SIZES.

No. 1 Shank.

Diameter millimetres	Decimal equivalent	Approx. length inches	Price each. High Speed	Price each. Carbon
6·5	·2559	6¼	6/–	2/9
7	·2756	6¼	6/3	2/9
7·5	·2953	6⅜	6/3	2/11
8	·3150	6⅜	6/3	3/2
8·5	·3347	6½	6/6	3/2
9	·3543	6⅝	6/6	3/4
9·5	·3740	6¾	6/6	3/4
10	·3937	7	7/–	3/9
10·5	·4134	7¼	7/–	4/2
11	·4331	7¼	7/6	4/2
11·5	·4528	7½	8/–	4/7
12	·4724	7½	8/–	5/–
12·5	·4921	7¾	8/6	5/–
13	·5118	8	9/–	5/5
13·5	·5315	8	9/–	5/10
14	·5512	8¼	9/–	5/10

No. 2 Shank.

Diameter millimetres	Decimal equivalent	Approx. length inches	Price each. High Speed	Price each. Carbon
14·5	·5709	8½	12/–	6/3
15	·5905	8½	12/6	6/3
15·5	·6102	8¾	13/–	6/8
16	·6299	8¾	13/–	7/1
16·5	·6496	9	13/6	7/1
17	·6693	9¼	14/–	7/6
17·5	·6890	9¼	14/–	7/11
18	·7087	9½	15/–	7/11
18·5	·7283	9¾	16/–	8/4
19	·7480	9¾	16/–	8/4
19·5	·7677	9⅞	17/–	8/9
20	·7874	10	17/6	9/2
20·5	·8071	10	18/–	9/2
21	·8268	10¼	19/–	10/–
21·5	·8465	10¼	19/–	10/10
22	·8661	10½	20/6	10/10
22·5	·8858	10⅝	22/–	11/8
23	·9055	10⅝	22/–	11/8

No. 3 Shank.

Diameter millimetres	Decimal equivalent	Approx. length inches	Price each. High Speed	Price each. Carbon
23·5	·9252	10¾	23/6	12/6
24	·9449	10⅞	25/–	13/7
24·5	·9645	10⅞	25/–	13/7
25	·9842	11	26/6	14/7
25·5	1·004	11	26/6	15/8
26	1·024	11⅛	29/–	15/8
26·5	1·043	11¼	30/–	16/8
27	1·063	11¼	31/–	17/9
27·5	1·083	11½	32/–	17/9
28	1·102	11¾	34/–	18/9
28·5	1·122	11¾	35/–	18/9
29	1·141	11⅞	36/–	19/10
29·5	1·161	11⅞	37/–	20/10
30	1·181	12	39/–	20/10
30·5	1·200	12⅛	41/–	21/11
31	1·220	12⅛	42/–	22/11
31·5	1·240	12½	44/–	22/11

No. 4 Shank

Diameter millimetres	Decimal equivalent	Approx. length inches	Price each. High Speed	Price each. Carbon
32	1·260	14⅛	52/–	24/–
32·5	1·280	14⅛	53/–	24/–
33	1·300	14¼	55/–	25/–
33·5	1·319	14⅜	57/–	26/1
34	1·339	14⅜	58/–	26/1
34·5	1·358	14½	60/–	27/1

No. 4 Shank (continued).

Diameter millimetres	Decimal equivalent	Approx. length inches	Price each. High Speed	Price each. Carbon
35	1·378	14½	62/–	29/2
35·5	1·398	14⅝	64/–	29/2
36	1·417	14¾	66/–	31/3
36·5	1·437	14¾	68/–	31/3
37	1·457	14⅞	70/–	33/4
37·5	1·476	15	74/–	35/5
38	1·496	15	76/–	35/5
38·5	1·516	15	78/–	37/6
39	1·533	15	80/–	39/7
39·5	1·555	15¼	84/–	39/7
40	1·575	15¼	86/–	41/8
40·5	1·595	15¼	88/–	43/9
41	1·614	15½	91/–	43/9
41·5	1·634	15½	93/6	45/10
42	1·654	15½	95/–	45/10
42·5	1·673	15¾	96/6	47/11
43	1·693	15¾	98/–	50/–
43·5	1·713	15¾	101/–	50/–
44	1·732	16	102/–	52/1
44·5	1·752	16	104/–	55/3
45	1·722	16	106/6	55/3
45·5	1·791	16¼	109/–	58/4
46	1·811	16¼	112/–	58/4
46·5	1·831	16¼	114/–	61/6
47	1·850	16¼	116/–	64/7
47·5	1·870	16½	120/–	64/7
48	1·890	16½	122/6	67/9
48·5	1·910	16½	125/–	70/10
49	1·935	16½	130/–	70/10
49·5	1·949	16½	132/6	74/–
50	1·969	16½	135/–	74/–

No. 5 Shank.

Diameter millimetres	Decimal equivalent	Approx. length inches	Price each. High Speed	Price each. Carbon
51	2·008	17	150/–	—
52	2·047	17	155/–	—
53	2·087	17	160/–	—
54	2·125	17	165/–	—
55	2·165	17	170/–	—
56	2·205	17½	177/6	—
57	2·244	17½	185/–	—
58	2·283	17½	192/6	—
59	2·323	18	200/–	—
60	2·362	18	210/–	—
61	2·402	18½	217/6	—
62	2·441	18½	225/–	—
63	2·480	19	235/–	—
64	2·520	19	245/–	—
65	2·559	19¼	260/–	—
66	2·598	19½	275/–	—
67	2·638	19½	285/–	—
68	2·677	20	295/–	—
69	2·717	20½	305/–	—
70	2·756	20½	315/–	—
71	2·795	20½	325/–	—
72	2·837	20½	340/–	—
73	2·874	21	355/–	—
74	2·913	21	370/–	—
75	2.953	21	385/–	—
76	2·992	22	400/–	—

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DRILLS.

Fig. 108. Carbon Steel Ratchet Twist Drills, with Square Taper Shanks.
No. 1 Shank, $\frac{5}{8}'' \times \frac{3}{8}'' \times 1\frac{1}{2}''$ long. No. 2 Shank, $\frac{3}{4}'' \times \frac{1}{2}'' \times 1\frac{3}{4}''$ long.

Fig. 109. Cast Steel Drills, for Ratchet Brace.

Assorted, $\frac{1}{4}$—$1\frac{1}{4}''$, **18/–** doz.
Larger sizes advance **2/–** per dozen per $\frac{1}{8}$ inch.

Prices of Fig. 108. Carbon Steel Ratchet Twist Drills.

Diam. In.	Price. each.	Diam. In.	Price each.	Diam. In.	Price each.
$\frac{1}{8}$	3/10	$\frac{19}{32}$	5/10	$1\frac{1}{16}$	11/10
$\frac{5}{32}$	4/–	$\frac{5}{8}$	5/10	$1\frac{3}{32}$	12/11
$\frac{3}{16}$	4/–	$\frac{21}{32}$	6/–	$1\frac{1}{8}$	12/11
$\frac{7}{32}$	4/2	$\frac{11}{16}$	6/–	$1\frac{5}{32}$	13/11
$\frac{1}{4}$	4/2	$\frac{23}{32}$	6/5	$1\frac{3}{16}$	13/11
$\frac{9}{32}$	4/5	$\frac{3}{4}$	6/5	$1\frac{7}{32}$	15/2
$\frac{5}{16}$	4/7	$\frac{25}{32}$	7/3	$1\frac{1}{4}$	15/2
$\frac{11}{32}$	4/10	$\frac{13}{16}$	7/3	$1\frac{9}{32}$	16/3
$\frac{3}{8}$	5/–	$\frac{27}{32}$	8/6	$1\frac{5}{16}$	16/3
$\frac{13}{32}$	5/2	$\frac{7}{8}$	8/6	$1\frac{11}{32}$	17/6
$\frac{7}{16}$	5/2	$\frac{29}{32}$	9/7	$1\frac{3}{8}$	17/6
$\frac{15}{32}$	5/5	$\frac{15}{16}$	9/7	$1\frac{13}{32}$	18/9
$\frac{1}{2}$	5/5	$\frac{31}{32}$	10/7	$1\frac{7}{16}$	18/9
$\frac{17}{32}$	5/7	1	10/7	$1\frac{15}{32}$	20/–
$\frac{9}{16}$	5/7	$1\frac{1}{32}$	11/10	$1\frac{1}{2}$	20/–

Fig. 110. Carbon Steel Bitstock Twist Drills,
Square Taper Shanks.

Diam. In.	Price per doz.	Diam. In.	Price per doz.	Diam. In.	Price each
$\frac{1}{16}$	10/6	$\frac{3}{8}$	35/6	$\frac{11}{16}$	7/3
$\frac{3}{32}$	11/3	$\frac{13}{32}$	38/6	$\frac{23}{32}$	7/10
$\frac{1}{8}$	12/6	$\frac{7}{16}$	43/9	$\frac{3}{4}$	8/4
$\frac{5}{32}$	14/9	$\frac{15}{32}$	49/–	$\frac{25}{32}$	8/10
$\frac{3}{16}$	16/9	$\frac{1}{2}$	54/3	$\frac{13}{16}$	9/5
$\frac{7}{32}$	18/9	$\frac{17}{32}$	4/11 each	$\frac{27}{32}$	9/11
$\frac{1}{4}$	21/–	$\frac{9}{16}$	5/5 ,,	$\frac{7}{8}$	10/5
$\frac{9}{32}$	25/–	$\frac{19}{32}$	5/10 ,,	$\frac{29}{32}$	11/–
$\frac{5}{16}$	29/3	$\frac{5}{8}$	6/3 ,,	$\frac{15}{16}$	11/6
$\frac{11}{32}$	33/6	$\frac{21}{32}$	6/9 ,,	1	12/6

Fig. 111. High-Speed Steel and Carbon Steel Centre Drills.

Letter.	Body Diam. Inch.	Drill Diameter. Inch.	Price per dozen. High Speed.	Price per dozen. Carbon.
A	$\frac{3}{10}$	$\frac{3}{32}$ and $\frac{1}{8}$	23/–	11/6
B	$\frac{3}{10}$	$\frac{1}{8}$	23/–	11/6
C	$\frac{3}{10}$	$\frac{3}{32}$	23/–	11/6
D	$\frac{15}{64}$	No. 45 and 49	21/–	10/6
E	$\frac{13}{64}$	$\frac{1}{16}$ and No. 45	19/–	9/6
F	$\frac{7}{16}$	$\frac{5}{32}$	29/–	14/9
G	$\frac{7}{16}$	$\frac{3}{16}$	29/–	14/9

PARALLEL SHANK DRILLS.

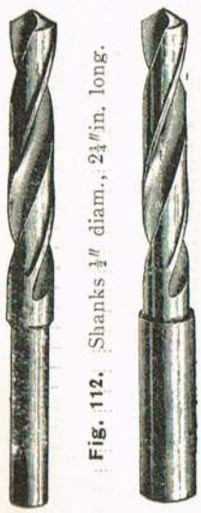

Fig. 112. Shanks $\frac{1}{2}''$ diam., $2\frac{1}{4}''$ in. long.

Fig. 113. Shanks $\frac{5}{8}''$ diam., $2\frac{1}{4}''$ long.

Diam. Inch.	Price each $\frac{1}{2}''$ Parallel Shank.	Price each $\frac{5}{8}''$ Parallel Shank.	Diam. Inch.	Price each $\frac{1}{2}''$ Parallel Shank.	Price each $\frac{5}{8}''$ Parallel Shank.	Diam. Inch.	Price each $\frac{1}{2}''$ Parallel Shank.	Price each $\frac{5}{8}''$ Parallel Shank.
$\frac{1}{8}$	1/10	2/3	$\frac{7}{16}$	3/9	4/3	$\frac{29}{32}$	9/9	9/9
$\frac{9}{64}$	2/–	2/5	$\frac{29}{64}$	4/–	4/6	$\frac{15}{16}$	9/9	9/9
$\frac{5}{32}$	2/–	2/5	$\frac{15}{32}$	4/–	4/6	$\frac{31}{32}$	10/6	10/6
$\frac{11}{64}$	2/3	2/6	$\frac{31}{64}$	4/3	4/9	1	10/6	10/6
$\frac{3}{16}$	2/3	2/6	$\frac{1}{2}$	4/3	4/9	$1\frac{1}{32}$	11/3	11/3
$\frac{13}{64}$	2/3	2/9	$\frac{33}{64}$	4/6	4/9	$1\frac{1}{16}$	11/3	11/3
$\frac{7}{32}$	2/3	2/9	$\frac{17}{32}$	4/6	4/9	$1\frac{3}{32}$	12/3	12/3
$\frac{15}{64}$	2/6	3/–	$\frac{35}{64}$	4/9	5/–	$1\frac{1}{8}$	12/3	12/3
$\frac{1}{4}$	2/6	3/–	$\frac{9}{16}$	4/9	5/–	$1\frac{5}{32}$	13/–	13/–
$\frac{17}{64}$	2/9	3/3	$\frac{37}{64}$	5/–	5/3	$1\frac{3}{16}$	13/–	13/–
$\frac{9}{32}$	2/9	3/3	$\frac{19}{32}$	5/–	5/3	$1\frac{7}{32}$	13/9	13/9
$\frac{19}{64}$	3/–	3/6	$\frac{5}{8}$	5/6	5/6	$1\frac{1}{4}$	13/9	13/9
$\frac{5}{16}$	3/–	3/6	$\frac{21}{32}$	6/3	6/3	$1\frac{9}{32}$	15/–	15/–
$\frac{21}{64}$	3/3	3/6	$\frac{11}{16}$	6/3	6/3	$1\frac{5}{16}$	15/–	15/–
$\frac{11}{32}$	3/3	3/6	$\frac{23}{32}$	7/3	7/3	$1\frac{11}{32}$	16/3	16/3
$\frac{23}{64}$	3/6	3/9	$\frac{3}{4}$	7/3	7/3	$1\frac{3}{8}$	16/3	16/3
$\frac{3}{8}$	3/6	3/9	$\frac{25}{32}$	8/–	8/–	$1\frac{13}{32}$	17/6	17/6
$\frac{25}{64}$	3/6	4/–	$\frac{13}{16}$	8/–	8/–	$1\frac{7}{16}$	17/6	17/6
$\frac{13}{32}$	3/6	4/–	$\frac{27}{32}$	8/9	8/9	$1\frac{15}{32}$	18/9	18/9
$\frac{27}{64}$	3/9	4/3	$\frac{7}{8}$	8/9	8/9	$1\frac{1}{2}$	18/9	18/9

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HAND REAMERS.

OF SPECIAL ALLOY STEEL.

Fig 114. Parallel Reamers have a small taper at the point for $\frac{1}{2}''$ to $\frac{3}{4}''$ up to ensure an easy start.

Fig. 114. Taper Reamers, have a straight taper the whole length of tap, $\frac{1}{32}''$ to the foot under $\frac{1}{4}''$ sizes and $\frac{1}{16}''$ to the foot for $\frac{1}{4}''$ sizes and over. Taper reamers are slightly shorter than parallel reamers.

Warranted true to 1/2000th of an inch.

Inch.	mm.	Length Overall. Inches.	Equivalent Decimal Inch.	Price each. s.	d.	Inch.	mm.	Length Overall. Inches.	Equivalent Decimal Inch.	Price each. s.	d.	Inch.	mm.	Length Overall. Inches.	Equivalent Decimal Inch.	Price each. s.	d.
3/32	—	3	·0937	3	6	—	16·5	7	·6496	9	0	1 1/4	—	12	1·2500	29	5
—	3	3	·1181	3	9	21/32	—	7	·6562	9	0	—	32	12	1·2595	31	4
1/8	—	3	·1250	3	9	—	17	7 1/2	·6693	10	0	—	32·5	12	1·2795	31	4
—	3·5	3 1/4	·1378	3	9	43/64	—	7 1/2	·6718	10	0	1 9/32	—	12	1·2812	31	4
9/64	—	3 1/4	·1406	3	9	11/16	—	7 1/2	·6875	10	0	—	33	12 1/2	1·2992	33	0
5/32	—	3 1/4	·1562	3	9	—	17·5	7 1/2	·6890	10	0	1 5/16	—	12 1/2	1·3125	33	0
—	4	3 1/2	·1575	3	9	45/64	—	7 1/2	·7031	11	0	—	33·5	12 1/2	1·3189	33	0
11/64	—	3 1/2	·1718	3	9	—	18	7 1/2	·7087	11	0	—	34	12 1/2	1·3386	33	0
—	4·5	3 1/2	·1772	3	9	23/32	—	7 1/2	·7187	11	0	1 11/32	—	12 1/2	1·3437	33	0
3/16	—	3 1/2	·1875	3	9	—	18·5	8	·7283	11	0	—	34·5	13	1·3583	34	8
—	5	3 3/4	·1969	4	0	47/64	—	8	·7343	11	0	1 5/8	—	13	1·3750	34	8
13/64	—	3 3/4	·2031	4	0	—	19	8	·7480	11	0	—	35	13	1·3779	34	8
—	5·5	3 3/4	·2165	4	0	3/4	—	8	·7500	11	0	—	35·5	13	1·3976	36	4
7/32	—	3 3/4	·2187	4	0	49/64	—	8	·7656	12	0	1 13/32	—	13	1·4062	36	4
15/64	—	3 3/4	·2345	4	0	—	19·5	8	·7677	12	0	—	36	13 1/2	1·4173	38	0
—	6	4	·2362	4	0	25/32	—	8	·7812	12	0	—	36·5	13 1/2	1·4370	38	0
1/4	—	4	·2500	4	0	—	20	8	·7874	12	0	1 7/16	—	13 1/2	1·4375	38	0
—	6·5	4 1/4	·2559	4	0	51/64	—	8 1/2	·7968	12	9	—	37	13 1/2	1·4567	39	7
17/64	—	4 1/4	·2656	4	0	—	20·5	8 1/2	·8071	12	9	1 15/32	—	13 1/2	1·4687	39	7
—	7	4 1/4	·2756	4	0	13/16	—	8 1/2	·8125	12	9	—	37·5	14	1·4764	39	7
9/32	—	4 1/4	·2812	4	0	—	21	8 1/2	·8268	14	0	—	38	14	1·4961	39	7
—	7·5	4 1/2	·2953	4	3	53/64	—	8 1/2	·8281	14	0	1 1/2	—	14	1·5000	39	7
19/64	—	4 1/2	·2968	4	3	27/32	—	8 1/2	·8437	14	0	—	38·5	14	1·5158	41	3
5/16	—	4 1/2	·3125	4	3	—	21·5	8 1/2	·8465	14	0	1 17/32	—	14	1·5312	41	3
—	8	4 1/2	·3150	4	3	55/64	—	9	·8593	15	0	—	39	14	1·5354	41	3
21/64	—	4 1/2	·3281	4	6	—	22	9	·8661	15	0	—	39·5	14	1·5551	42	11
—	8·5	4 1/2	·3346	4	6	7/8	—	9	·8750	15	0	1 9/16	—	14	1·5625	42	11
11/32	—	4 3/4	·3437	4	6	—	22·5	9	·8858	15	0	—	40	14	1·5748	42	11
—	9	5	·3543	5	0	57/64	—	9	·8906	15	0	1 19/32	—	14	1·5937	44	6
23/64	—	5	·3593	5	0	—	23	9	·9055	15	0	—	40·5	14	1·5945	44	6
—	9·5	5	·3740	5	0	29/32	—	9	·9062	15	0	—	41	14 1/4	1·6142	44	6
3/8	—	5	·3750	5	0	59/64	—	9 1/2	·9218	16	0	1 5/8	—	14 1/4	1·6250	44	6
25/64	—	5	·3906	5	6	—	23·5	9 1/2	·9252	16	0	—	41·5	14 1/4	1·6339	44	6
—	10	5	·3937	5	6	15/16	—	9 1/2	·9375	16	0	—	42	14 1/4	1·6536	46	3
13/32	—	5	·4062	5	6	—	24	9 1/2	·9449	17	3	1 21/32	—	14 1/4	1·6562	46	3
—	10·5	5 1/2	·4134	5	6	61/64	—	9 1/2	·9531	17	3	—	42·5	14 1/4	1·6733	47	10
27/64	—	5 1/2	·4218	5	6	—	24·5	9 1/2	·9646	17	3	1 11/16	—	14 1/4	1·6875	47	10
—	11	5 1/2	·4330	5	6	31/32	—	9 1/2	·9687	17	3	—	43	14 1/4	1·6929	47	10
7/16	—	5 1/2	·4375	5	6	—	25	10	·9842	18	3	—	43·5	14 1/4	1·7126	49	6
—	11·5	5 1/2	·4528	6	0	63/64	—	10	·9843	18	3	1 23/32	—	14 1/4	1·7187	49	6
29/64	—	5 1/2	·4531	6	0	1	—	10	1·0000	18	3	—	44	14 1/4	1·7323	49	6
15/32	—	5 1/2	·4687	6	0	—	25·5	10	1·0040	20	8	1 3/4	—	14 1/2	1·7500	52	0
—	12	6	·4724	6	9	1 1/64	—	10	1·0156	20	8	—	44·5	14 1/2	1·7520	52	0
31/64	—	6	·4843	6	9	—	26	10	1·0236	20	8	—	45	14 1/2	1·7717	52	0
—	12·5	6	·4921	6	9	1 1/32	—	10	1·0312	20	8	1 25/32	—	14 1/2	1·7812	53	6
1/2	—	6	·5000	6	9	—	26·5	10 1/2	1·0433	21	6	—	45·5	14 1/2	1·7914	53	6
—	13	6	·5118	7	3	1 1/16	—	10 1/2	1·0625	21	6	—	46	14 1/2	1·8110	53	6
33/64	—	6	·5156	7	3	—	27	10 1/2	1·0630	21	6	1 13/16	—	14 1/2	1·8125	53	6
17/32	—	6	·5312	7	3	—	27·5	10 1/2	1·0827	22	10	—	46·5	14 1/2	1·8307	56	11
—	13·5	6	·5315	7	3	1 3/32	—	10 1/2	1·0937	22	10	1 27/32	—	14 1/2	1·8437	56	11
35/64	—	6 1/2	·5468	8	0	—	28	11	1·1024	24	3	—	47	14 1/2	1·8504	56	11
—	14	6 1/2	·5512	8	0	—	28·5	11	1·1220	24	3	—	47·5	14 3/4	1·8701	59	5
9/16	—	6 1/2	·5625	8	0	1 1/8	—	11	1·1250	24	3	1 7/8	—	14 3/4	1·8750	59	5
—	14·5	6 1/2	·5709	8	0	—	29	11	1·1417	25	4	—	48	14 3/4	1·8898	59	5
37/64	—	6 1/2	·5781	8	0	1 5/32	—	11	1·1562	25	4	1 29/32	—	14 3/4	1·9062	61	11
—	15	6 1/2	·5906	8	0	—	29·5	11 1/2	1·1614	25	4	—	48·5	14 3/4	1·9095	61	11
19/32	—	6 1/2	·5937	8	0	—	30	11 1/2	1·1811	25	4	—	49	14 3/4	1·9291	61	11
—	15·5	7	·6102	8	6	1 3/16	—	11 1/2	1·1875	25	4	1 15/16	—	14 3/4	1·9375	62	8
39/64	—	7	·6193	8	6	—	30·5	11 1/2	1·2008	27	6	—	49·5	14 3/4	1·9488	62	8
5/8	—	7	·6250	8	6	1 7/32	—	11 1/2	1·2187	27	6	—	50	14 3/4	1·9685	65	2
—	16	7	·6299	8	6	—	31	11 1/2	1·2205	27	6	1 31/32	—	14 3/4	1·9687	65	2
41/64	—	7	·6406	9	0	—	31·5	12	1·2402	29	5	2	—	15	2·0000	68	6

N.B.—Parallel Sixty-fourth diameters above $1\frac{1}{64}''$ made to order within about 7 days, but the price would be that of the next size higher by $\frac{3}{64}''$.

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REAMERS.

ENGINEERS' HAND REAMERS.

Fig. 116. Straight Flute.

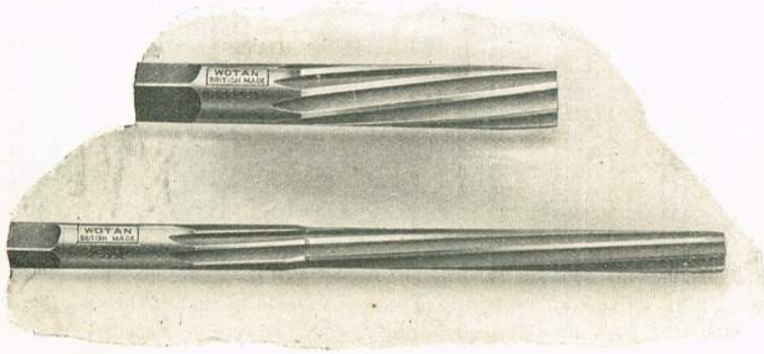
Fig. 117. Spiral Flute.
Same Prices.

Diameter. inch	Diameter. m/m	Length of Flute	Length Over-all.	Price each. Carbon Steel.	Price each. High Speed
$\frac{1}{8}$	3·0	$1\frac{1}{2}$	3	**3/6**	**3/9**
$\frac{5}{32}$	4·0	$1\frac{5}{8}$	$3\frac{1}{4}$	**3/6**	**3/9**
$\frac{3}{16}$	5·0	$1\frac{3}{4}$	$3\frac{1}{2}$	**3/6**	**4/–**
$\frac{7}{32}$	6·0	$1\frac{7}{8}$	$3\frac{3}{4}$	**3/6**	**4/–**
$\frac{1}{4}$	6·5	2	4	**3/6**	**4/3**
$\frac{9}{32}$	7·0	$2\frac{1}{8}$	$4\frac{1}{4}$	**3/9**	**4/6**
$\frac{5}{16}$	8·0	$2\frac{1}{4}$	$4\frac{1}{2}$	**3/9**	**4/9**
$\frac{11}{32}$	9·0	$2\frac{3}{8}$	$4\frac{3}{4}$	**4/–**	**5/–**
$\frac{3}{8}$	9·5	$2\frac{1}{2}$	5	**4/–**	**5/6**
$\frac{13}{32}$	10·0	$2\frac{5}{8}$	$5\frac{1}{4}$	**4/6**	**5/9**
$\frac{7}{16}$	11·0	$2\frac{3}{4}$	$5\frac{1}{2}$	**4/6**	**6/3**
$\frac{15}{32}$	12·0	$2\frac{7}{8}$	$5\frac{3}{4}$	**5/–**	**6/6**
$\frac{1}{2}$	12·5	3	6	**5/–**	**7/–**
$\frac{17}{32}$	13·5	$3\frac{1}{8}$	$6\frac{1}{4}$	**6/–**	**8/–**
$\frac{9}{16}$	14·5	$3\frac{1}{4}$	$6\frac{1}{2}$	**6/–**	**9/–**
$\frac{19}{32}$	15·0	$3\frac{3}{8}$	$6\frac{3}{4}$	**7/–**	**10/–**
$\frac{5}{8}$	15·5	$3\frac{1}{2}$	7	**7/–**	**11/–**
$\frac{21}{32}$	16·5	$3\frac{13}{64}$	$7\frac{11}{32}$	**8/–**	**12/6**
$\frac{11}{16}$	17·5	$3\frac{27}{32}$	$7\frac{11}{16}$	**9/–**	**14/–**
$\frac{23}{32}$	18·0	$4\frac{1}{16}$	$8\frac{1}{8}$	**10/–**	**15/6**
$\frac{3}{4}$	19·0	$4\frac{13}{16}$	$8\frac{3}{8}$	**11/–**	**17/–**
$\frac{25}{32}$	20·0	$4\frac{23}{64}$	$8\frac{23}{32}$	**12/–**	**19/–**
$\frac{13}{16}$	20·5	$4\frac{17}{32}$	$9\frac{1}{16}$	**13/–**	**21/–**
$\frac{27}{32}$	21·0	$4\frac{11}{16}$	$9\frac{3}{8}$	**14/–**	**23/–**
$\frac{7}{8}$	22·0	$4\frac{27}{32}$	$9\frac{11}{16}$	**15/–**	**25/–**
$\frac{29}{32}$	23·0	$5\frac{3}{64}$	$10\frac{3}{32}$	**16/–**	**27/–**
$\frac{15}{16}$	23·5	$5\frac{1}{8}$	$10\frac{1}{4}$	**17/–**	**29/–**
$\frac{31}{32}$	24·0	$5\frac{11}{32}$	$10\frac{11}{16}$	**18/–**	**31/–**
1	25·0	$5\frac{7}{16}$	$10\frac{7}{8}$	**19/–**	**33/–**
$1\frac{1}{32}$	26·0	$5\frac{17}{32}$	$11\frac{1}{16}$	**20/–**	**35/–**
$1\frac{1}{16}$	27·0	$5\frac{5}{8}$	$11\frac{1}{4}$	**21/–**	**37/–**
$1\frac{3}{32}$	28·0	$5\frac{23}{32}$	$11\frac{7}{16}$	**22/–**	**40/–**
$1\frac{1}{8}$	28·5	$5\frac{13}{16}$	$11\frac{5}{8}$	**23/–**	**43/–**
$1\frac{5}{32}$	29·5	$5\frac{29}{32}$	$11\frac{13}{16}$	**24/–**	**45/–**
$1\frac{3}{16}$	30·0	6	12	**25/–**	**47/–**
$1\frac{7}{32}$	31·0	$6\frac{1}{16}$	$12\frac{1}{8}$	**26/–**	**50/–**
$1\frac{1}{4}$	32·0	$6\frac{1}{8}$	$12\frac{1}{4}$	**27/–**	**53/–**
$1\frac{9}{32}$	32·5	$6\frac{11}{64}$	$12\frac{11}{32}$	**28/6**	**56/–**
$1\frac{5}{16}$	33·0	$6\frac{7}{32}$	$12\frac{7}{16}$	**30/–**	**59/–**
$1\frac{11}{32}$	34·0	$6\frac{17}{64}$	$12\frac{17}{32}$	**31/6**	**62/–**
$1\frac{3}{8}$	35·0	$6\frac{5}{16}$	$12\frac{5}{8}$	**33/–**	**65/–**
$1\frac{13}{32}$	35·5	$6\frac{23}{64}$	$12\frac{23}{32}$	**34/6**	**68/–**
$1\frac{7}{16}$	36·5	$6\frac{13}{32}$	$12\frac{13}{16}$	**36/–**	**72/–**
$1\frac{15}{32}$	37·0	$6\frac{29}{64}$	$12\frac{29}{32}$	**37/6**	**75/–**
$1\frac{1}{2}$	38·0	$6\frac{1}{2}$	13	**39/–**	**78/–**
$1\frac{17}{32}$	39·0	$6\frac{1}{2}$	13	**40/6**	**81/–**
$1\frac{9}{16}$	40·0	$6\frac{1}{2}$	13	**42/–**	**85/–**
$1\frac{19}{32}$	40·5	$6\frac{1}{2}$	13	**44/–**	**90/–**
$1\frac{5}{8}$	41·0	$6\frac{1}{2}$	13	**46/–**	**98/–**
$1\frac{11}{16}$	42·5	$6\frac{3}{4}$	$13\frac{1}{2}$	**50/–**	**106/–**
$1\frac{3}{4}$	44·5	$6\frac{3}{4}$	$13\frac{1}{2}$	**54/–**	**116/–**
$1\frac{13}{16}$	46·0	$6\frac{3}{4}$	$13\frac{1}{2}$	**58/–**	**126/–**
$1\frac{7}{8}$	47·5	7	14	**62/–**	**136/–**
$1\frac{15}{16}$	49·0	7	14	**66/–**	**146/–**
2	50·0	7	14	**70/–**	**156/–**
$2\frac{1}{16}$	52·0	$7\frac{1}{4}$	$14\frac{1}{2}$	**76/–**	**166/–**
$2\frac{1}{8}$	54·0	$7\frac{1}{4}$	$14\frac{1}{2}$	**82/–**	**178/–**
$2\frac{3}{16}$	55·5	$7\frac{1}{2}$	15	**88/–**	**190/–**
$2\frac{1}{4}$	57·0	$7\frac{1}{2}$	15	**94/–**	**202/–**
$2\frac{5}{16}$	58·5	$7\frac{1}{2}$	15	**100/–**	**214/–**
$2\frac{3}{8}$	60·0	$7\frac{1}{2}$	15	**108/–**	**226/–**
$2\frac{7}{16}$	62·0	$7\frac{3}{4}$	$15\frac{1}{2}$	**116/–**	**240/–**
$2\frac{1}{2}$	63·5	$7\frac{3}{4}$	$15\frac{1}{2}$	**124/–**	**254/–**

Fig. 118. Standard Taper-Pin Hand Reamers. Taper, $\frac{1}{4}''$ per foot. The diameter is taken at the extreme end. The sizes of these reamers are so arranged that each overlaps about $\frac{1}{2}''$ the size smaller; the taper being the same.

	High-speed Steel.						Carbon Steel.								
Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Diam. at small end inch	·135	·146	·162	·183	·208	·242	·273	·331	·398	·482	·581	·706	·842	1·009	1·250
Length of flute	$1\frac{7}{16}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$2\frac{9}{16}$	3	$3\frac{3}{4}$	$4\frac{1}{2}$	$5\frac{3}{16}$	$6\frac{1}{8}$	7	$8\frac{1}{4}$....	10	12	14
Total length	$2\frac{5}{16}$	$2\frac{9}{16}$	$2\frac{7}{8}$	$3\frac{1}{4}$	$3\frac{13}{16}$	$4\frac{3}{8}$	$5\frac{1}{4}$	$6\frac{1}{4}$	$7\frac{3}{16}$	$8\frac{3}{8}$	$9\frac{1}{2}$	$11\frac{1}{4}$	$13\frac{1}{2}$	16	$18\frac{1}{4}$
Price each	**6/–**	**6/–**	**6/3**	**6/6**	**7/–**	**8/6**	**7/6**	**8/6**	**10/–**	**12/6**	**16/6**	**22/–**	**30/–**	**45/–**	**66/–**

Nos. 0 to 5 in High-speed only as the extra cost is small and a much better tool.



SPECIAL REAMERS FOR FORD REPAIR SETS.
Of Special Alloy Steel.

Fig. 119. Ford Type No. 2713-4.—To repair Spindle Body and Spindle Arm Bushing, a 2 in 1 reamer for front axle bushings. The 5-inch section reams the spindle body bushings in perfect alignment at one operation. The 1-inch section is for use under spindle arm bushing. Price, **12/8** each.

Fig. 120. Ford Type No. 3022½ is used for reaming through both the Piston Pin Bushings to ensure perfect alignment of the holes for the Gudgeon Pins. Price, **9/4** each.

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Fig. 121. High-speed Steel Corkscrew and Fig. 122 Straight Fluted Reamers, with Morse taper shanks, for boilermakers, bridge and ship builders, etc. Designed for heavy duty in drill presses or pneumatic air drilling machines.

Diameter at A and B, inches	5/8	11/16	3/4	13/16	7/8	15/16	1	1 1/16	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8"	1 7/16	1 1/2
Diameter at C, inches	11/32	3/8	7/16	1/2	9/16	5/8	11/16	23/32	13/16	29/32	1	1	1 1/16	1 1/8	1 3/16
Length of flute, both patterns, inches	6 1/4	6 1/4	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8	7 5/8
Length over all, both patterns, inches	10	10	12	12	12	12	12	12	12	12	12	13	13	13	13
Morse taper shank	2	2	3	3	3	3	3	3	3	3	3	4	4	4	4
Fig. 121. Corkscrew pattern, High-speed steel, price each....	**19/6**	**19/6**	**32/–**	**33/–**	**35/–**	**37/6**	**39/–**	**42/6**	**46/–**	**51/–**	**57/–**	**65/–**	**71/–**	**77/–**	**86/–**
Fig. 122. Straight fluted reamer:															
High-speed steel, price each	**18/6**	**18/6**	**31/–**	**32/–**	**34/–**	**36/6**	**38/–**	**41/–**	**45/–**	**50/–**	**56/–**	**64/–**	**70/–**	**76/–**	**85/–**
Carbon steel, price each	**9/–**	**9/–**	**14/–**	**15/–**	**16/6**	**17/6**	**19/–**	**21/–**	**23/–**	**25/–**	**27/–**	**30/–**	**33/–**	**36/6**	**40/–**

Fig. 123.

Best Quality Engineers' Straight Fluted Taper or Parallel Hand Reamers.

Fig. 124.

Diameter ins.	Diameter m/m	Length overall ins.	Price each. Carbon Steel	Price each. High Speed Steel
1/8	3	2 1/2	**2/6**	**3/9**
	3 1/2	2 1/2	**2/6**	**3/9**
5/32	4	3 1/8	**2/6**	**3/9**
	4 1/2	3 1/8	**2/6**	**3/9**
3/16	5	3 1/8	**2/6**	**3/9**
	5 1/2	3 1/8	**2/9**	**4/–**
7/32	6	3 3/4	**2/9**	**4/–**
1/4	6 1/2	3 3/4	**2/9**	**4/–**
9/32	7	4 1/8	**3/–**	**4/6**
	7 1/2	4 1/8	**3/–**	**4/6**
5/16	8	4 1/8	**3/–**	**4/6**
	8 1/2	4 1/8	**3/3**	**4/6**
11/32	9	4 1/2	**3/3**	**4/9**
3/8	9 1/2	4 1/2	**3/3**	**5/–**
13/32	10	4 7/8	**3/6**	**5/9**
	10 1/2	4 7/8	**3/6**	**5/9**
7/16	11	4 7/8	**3/6**	**5/9**
	11 1/2	4 7/8	**4/–**	**6/6**
15/32	12	5 1/4	**4/–**	**6/6**
1/2	12 1/2	5 1/4	**4/–**	**6/6**
	13	5 1/2	**4/9**	**7/6**
17/32	13 1/2	5 1/2	**4/9**	**7/6**
	14	5 1/2	**4/9**	**8/3**
9/16	14 1/2	5 1/2	**4/9**	**8/3**
19/32	15	5 3/4	**5/6**	**9/–**
5/8	15 1/2	5 3/4	**5/6**	**9/6**
	16	6 1/8	**6/3**	**10/6**
21/32	16 1/2	6 1/8	**6/3**	**10/6**
	17	6 1/8	**6/3**	**11/6**
11/16	17 1/2	6 1/8	**6/3**	**11/6**
23/32	18	6 1/2	**7/–**	**13/–**
	18 1/2	6 1/2	**7/–**	**14/–**
3/4	19	6 1/2	**7/–**	**14/–**
	19 1/2	7	**7/9**	**15/6**
25/32	20	7	**7/9**	**15/6**
13/16	20	7 1/2	**7/9**	**16/6**
27/32	21	7 1/2	**8/9**	**18/6**
	21 1/2	7 1/2	**8/9**	**20/–**
7/8	22	7 1/2	**8/9**	**20/–**
	22 1/2	7 1/2	**9/6**	**22/–**
29/32	23	7 7/8	**9/6**	**22/-**

Diameter ins.	Diameter m/m	Length overall ins.	Price each. Carbon Steel	Price each. High Speed Steel
15/16	23 1/2	7 7/8	**10/6**	**23/–**
31/32	24	8 1/4	**11/6**	**25/6**
	24 1/2	8 1/4	**12/6**	**27/–**
1	25	8 1/4	**12/6**	**27/–**
	25 1/2	8 1/4	**14/–**	**29/6**
1 1/32	26	8 5/8	**14/–**	**29/6**
	26 1/2	8 5/8	**15/–**	**31/6**
1 1/16	27	8 5/8	**15/–**	**31/6**
	27 1/2	8 5/8	**16/6**	**33/6**
1 3/32	28	9	**16/6**	**33/6**
1 1/8	28 1/2	9	**17/6**	**35/–**
	29	9 3/8	**19/–**	**38/–**
1 5/32	29 1/2	9 3/8	**19/–**	**40/–**
1 3/16	30	9 3/8	**20/6**	**40/–**
	30 1/2	9 3/8	**22/6**	**43/–**
1 7/32	31	9 3/4	**22/6**	**43/–**
	31 1/2	9 3/4	**24/–**	**45/–**
1 1/4	32	9 3/4	**24/–**	**45/–**
1 9/32	32 1/2	10 1/8	**25/6**	**48/–**
1 5/16	33	10 1/8	**26/6**	**50/–**
	33 1/2	10 1/8	**28/–**	**53/–**
1 11/32	34	10 1/2	**28/–**	**53/–**
	34 1/2	10 1/2	**29/6**	**55/–**
1 3/8	35	10 1/2	**29/6**	**55/–**
1 13/32	35 1/2	10 1/2	**32/–**	**57/6**
	36	10 7/8	**34/6**	**60/–**
1 7/16	36 1/2	10 7/8	**34/6**	**60/–**
1 15/32	37	10 7/8	**36/–**	**62/6**
	37 1/2	10 7/8	**38/–**	**66/–**
1 1/2	38	11 1/4	**38/–**	**66/–**
	38 1/2	11 1/4	**40/–**	**69/–**
1 17/32	39	11 1/4	**40/–**	**69/–**
	39 1/2	11 1/4	**42/–**	**72/–**
1 9/16	40	11 1/4	**42/–**	**72/–**
1 19/32	40 1/2	11 3/4	**45/–**	**76/–**
1 5/8	41	11 3/4	**47/–**	**80/–**
	41 1/2	11 3/4	**50/–**	**87/–**
	42	12	**50/–**	**87/–**
1 11/16	42 1/2	12	**50/–**	**87/–**
	43	12	**53/–**	**97/–**
	43 1/2	12	**53/–**	**97/–**

Diameter ins.	Diameter m/m	Length overall ins.	Price each. Carbon Steel	Price each. High Speed Steel
	44	12	**53/–**	**97/–**
1 3/4	44 1/2	12	**53/–**	**97/–**
	45	12	**56/–**	**107/–**
	45 1/2	12	**56/–**	**107/–**
1 13/16	46	12	**56/–**	**107/–**
	46 1/2	12	**59/–**	**120/–**
	47	13	**59/–**	**120/–**
1 7/8	47 1/2	13	**59/–**	**120/–**
	48	13	**62/–**	**130/**
	48 1/2	13	**62/–**	**130/–**
1 15/16	49	13	**62/–**	**130/–**
	49 1/2	13	**65/–**	**140/–**
2	50	13	**65/–**	**140/–**
	50 1/2	13	**69/–**	**152/–**
	51	13	**69/–**	**152/–**
	51 1/2	13	**69/–**	**152/–**
2 1/16	52	13 1/2	**69/–**	**152/–**
	52 1/2	13 1/2	**73/–**	**162/–**
	53	13 1/2	**73/–**	**162/–**
	53 1/2	13 1/2	**73/–**	**162/–**
2 1/8	54	13 1/2	**73/–**	**162/–**
	54 1/2	13 1/2	**78/–**	**172/–**
	55	13 1/2	**78/–**	**172/–**
2 3/16	55 1/2	13 1/2	**78/–**	**172/–**
	56	13 1/2	**84/–**	**184/–**
	56 1/2	13 1/2	**84/–**	**184/–**
2 1/4	57	13 3/4	**84/–**	**184/–**
	57 1/2	13 3/4	**90/–**	**196/–**
	58	13 3/4	**90/–**	**196/–**
2 5/16	58 1/2	13 3/4	**90/–**	**196/–**
	59	13 3/4	**97/–**	**210/–**
	59 1/2	13 3/4	**97/–**	**210/–**
2 3/8	60	14	**97/–**	**210/–**
	60 1/2	14	**104/–**	**222/–**
	61	14	**104/–**	**222/–**
	61 1/2	14	**104/–**	**222/–**
2 7/16	62	14	**104/–**	**222/–**
	62 1/2	14	**111/–**	**240/–**
	63	14	**111/–**	**240/–**
2 1/2	63 1/2	14	**111/–**	**240/–**

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MACHINE REAMERS of Special Alloy Steel.

Fig. 125. With Morse Taper Shanks.

Taper Shank.	Diam. in Ins.	Diam. in Mms.	Price each	Length of Flute Ins.	Length Overall. Ins.
No. 1	1/4	6 1/2	**11/1**	2	5 1/4
	9/32	7	**11/4**	2 1/8	5 3/8
	5/16	8	**11/8**	2 1/4	5 1/2
	11/32	9	**12/3**	2 3/8	5 5/8
	3/8	9 1/2	**12/6**	2 1/2	5 3/4
	13/32	10	**13/2**	2 1/2	5 3/4
	7/16	11 1/2	**13/8**	2 3/4	6
	15/32	12	**14/4**	2 3/4	6
	1/2	13	**14/7**	3	6 1/4
	17/32	13 1/2	**15/6**	3	6 1/4
	9/16	14 1/2	**15/9**	3 1/8	6 1/2
No. 2—	19/32	15	**16/8**	3 1/4	7 1/8
	5/8	16	**16/11**	3 1/2	7 3/8
	21/32	16 1/2	**17/6**	3 1/2	7 3/8
	11/16	17 1/2	**18/4**	3 3/4	7 5/8
	23/32	18	**19/–**	3 3/4	7 5/8
	3/4	19	**19/10**	4	7 7/8
	25/32	20	**20/5**	4	7 5/8
	13/16	21	**21/4**	4 1/4	8 1/8
No. 2	27/32	21 1/2	**22/6**	4 1/4	8 1/8
	7/8	22 1/2	**23/8**	4 1/2	8 3/8
	29/32	23	**24/6**	4 1/2	8 3/8
	15/16	24	**25/8**	4 3/4	8 5/8
No. 3	31/32	24 1/2	**26/10**	4 1/2	9 1/2
	1	25 1/2	**27/8**	5	9 3/4
	1 1/32	26	**28/10**	5	9 3/4
	1 1/16	27	**30/–**	5 1/4	10
	1 3/32	28	**31/2**	5 1/4	10
	1 1/8	28 1/2	**32/1**	5 1/2	10 1/4
	1 5/32	29	**33/3**	5 1/2	10 1/4
	1 3/16	30	**34/5**	5 3/4	10 1/2
	1 7/32	31	**35/7**	5 3/4	10 1/2
	1 1/4	32	**36/6**	6	10 3/4
	1 9/32	33	**37/8**	6	10 3/4
No. 4	1 5/16	33 1/2	**38/10**	6 1/4	12 1/2
	1 11/32	34	**40/3**	6 1/4	12 1/2
	1 3/8	35	**41/8**	6 1/2	12 3/4
	1 13/32	36	**43/2**	6 1/2	12 3/4
No. 4	1 7/16	36 1/2	**44/8**	6 3/4	13
	1 15/32	37 1/2	**46/1**	6 3/4	13
	1 1/2	38 1/2	**47/6**	7	13 1/4
	1 17/32	39	**49/–**	7	13 1/4
	1 9/16	40	**50/6**	7	13 1/4
	1 19/32	40 1/2	**51/11**	7	13 1/4
	1 5/8	41 1/2	**53/4**	7 1/8	13 3/4
	1 21/32	42	**54/10**	7 1/8	13 3/4
	1 11/16	43	**56/4**	7 1/8	13 3/8
	1 23/32	44	**57/6**	7 1/8	13 3/8
	1 3/4	44 1/2	**58/4**	7 1/4	13 1/2
	1 25/32	45	**59/10**	7 1/4	13 1/2
	1 13/16	46	**61/3**	7 1/4	13 1/2
	1 27/32	47	**62/8**	7 1/4	13 1/2
	1 7/8	48	**64/2**	7 3/8	13 5/8
	1 29/32	49	**65/8**	7 3/8	13 5/8
	1 15/16	49 1/2	**67/1**	7 3/8	13 5/8
	1 31/32	50	**68/6**	7 3/8	13 5/8
	2	51	**70/–**	7 1/2	13 3/4

Fig. 126. HAND REAMERS SETS IN WOODEN BOXES

It is essential that Reamers are not left about on the Bench, as the cutting edges get damaged easily. With a view to providing safe and handy means to store the "**Wotan**" British Made Reamers the following sets have been introduced. **The Boxes are strong, well finished and varnished.** The Boxes are of solid wood, in which holes of the correct length and suitable diameter have been bored.

Set No.	Comprising—	Price per Set.
1	3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 13/32, 7/16, 15/32, 1/2	**54/–**
2	1/4, 5/16, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4	**54/–**
3	1/2, 9/16, 5/8, 11/16, 3/4, 13/16, 7/8, 15/16, 1	**107/–**
4	5 6 7 8 9 10 11 12 mm.	**39/6**
5	5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 mm. ...	**115/6**
6	3/16″ to 1″, rising in 1/16″ = 14 Reamers	**129/6**
7	1/4″ to 1″, rising in 1/8″ = 7 Reamers	**69/–**

Fig. 127. HAND TAPER PIN REAMERS.

Taper 1/4 in. per foot (1 in 48).

These Reamers all have the same taper, and each will overlay in convenient measure the next size smaller, and are always with straight flutes.

Pin No.	Approx. Fractional Sizes. Ins.	Length overall. Ins.	Length of Flutes. Ins.	Diameter Small End. Ins.	Standard Square Head. No.	Price each.
000	—	2	1 3/8	0·101	—	**7/9**
00	—	2 1/4	1 1/2	0·114	—	**7/2**
0	5/32	2 1/4	1 1/2	0·135	0	**4/2**
1	11/64	2 1/2	1 3/4	0·146	1	**4/7**
2	3/16	3	2	0·162	2	**5/6**
3	7/32	3 1/2	2 1/4	0·183	2	**6/3**
4	1/4	4	2 1/2	0·208	3	**6/6**
5	15/64	4 1/2	3	0·240	4	**7/–**
6	11/32	5	3 5/8	0·279	4	**8/3**
7	13/32	6	4 1/2	0·331	6	**9/3**
8	1/2	6 3/4	5 1/4	0·398	7	**11/1**
9	19/32	8	6 1/8	0·482	8	**13/10**
10	23/32	9	7	0·581	9	**15/3**
11	27/32	11 1/4	8 1/4	0·706	10	**16/7**
12	1	13 3/8	10	0·842	11	**19/6**

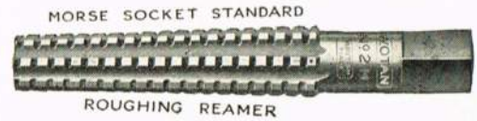

Fig. 128. HAND MORSE SOCKET REAMERS.

With straight flutes.

Socket No.	Length Length Overall. Ins.	Mm.	Length of Cutting Edges. Ins.	Mm.	Standard Square Head. No.	Price each. Finishing.	Roughing.
0	3 1/4	82·54	2 1/4	57·15	4	**6/8**	**7/–**
1	3 3/4	95·25	2 1/2	63·50	6	**8/4**	**10/–**
2	4 1/2	114·30	3	76·20	8	**10/10**	**12/11**
3	5 1/2	139·7	3 3/4	95·25	10	**14/2**	**17/1**
4	6 7/8	174·62	4 5/8	117·47	12	**17/6**	**21/1**
5	8 1/2	215·90	6	152·50	16	**27/6**	**32/11**

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SOLID MACHINE REAMERS, with Morse Taper Shanks.

Straight Flute.
Fig. 129.

Spiral Flute.
Fig. 130.

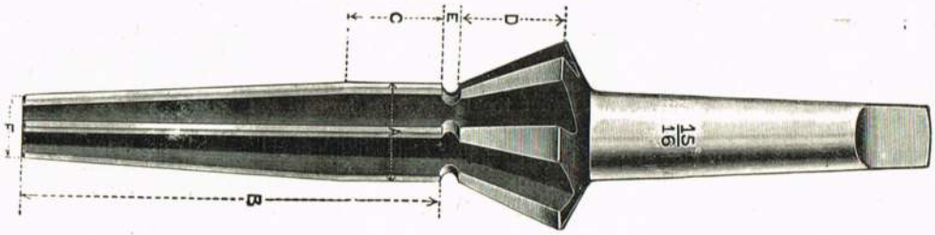
Straight or Spiral Flute same Price.

Diameter. Ins.	Diameter. m/m	Length of flute.	Length over-all.	Price each. Carbon Steel.	Price each. High Speed.
		Morse Taper Shank No. 1.			
1/4	6·5	2	5 3/16	**4/6**	**5/–**
9/32	7·0	2 1/8	5 5/16	**4/9**	**5/3**
5/16	8·0	2 1/4	5 1/2	**4/9**	**5/6**
11/32	9·0	2 3/8	5 5/8	**5/–**	**5/9**
3/8	9·5	2 1/2	5 13/16	**5/–**	**6/–**
13/32	10·0	2 5/8	5 15/16	**5/3**	**6/6**
7/16	11·0	2 3/4	6 1/8	**5/3**	**7/–**
15/32	12·0	2 7/8	6 1/4	**5/6**	**7/6**
1/2	12·5	3	6 7/16	**5/9**	**8/–**
17/32	13·5	3 1/8	6 9/16	**6/3**	**8/9**
9/16	14·5	3 1/4	6 3/4	**6/9**	**9/6**
19/32	15·0	3 3/8	6 7/8	**7/3**	**10/6**
		Morse Taper Shank No. 2.			
5/8	15·5	3 1/2	7 9/16	**8/–**	**12/6**
21/32	16·5	3 11/16	7 3/4	**9/–**	**13/6**
11/16	17·5	3 7/8	8	**10/–**	**14/6**
23/32	18·0	4 1/16	8 3/16	**11/–**	**16/–**
3/4	19·0	4 3/16	8 3/8	**12/–**	**17/6**
25/32	20·0	4 3/8	8 9/16	**12/6**	**19/–**
13/16	20·5	4 9/16	8 13/16	**13/–**	**21/–**
27/32	21·0	4 11/16	8 15/16	**14/–**	**23/–**
7/8	22·0	4 7/8	9 3/16	**15/–**	**25/–**
29/32	23·0	5	9 5/16	**16/–**	**27/–**
15/16	23·5	5 1/8	10 3/16	**17/6**	**29/–**
31/32	24·0	5 5/16	10 3/8	**18/6**	**31/–**
1	25·0	5 7/16	10 9/16	**19/6**	**33/–**
1 1/32	26·0	5 9/16	10 11/16	**20/6**	**35/–**
1 1/16	27·0	5 5/8	10 13/16	**21/6**	**37/–**
1 3/32	28·0	5 3/4	10 15/16	**22/6**	**40/–**
1 1/8	28·5	5 13/16	11 1/16	**23/6**	**43/–**
1 5/32	29·5	5 15/16	11 3/16	**24/6**	**45/–**
1 3/16	30·0	6	11 5/16	**25/6**	**47/–**
1 7/32	31·0	6 1/16	11 3/8	**26/6**	**50/–**
		Morse Taper Shank No. 3.			
1 1/4	32·0	6 1/8	12 1/2	**28/–**	**54/–**
1 5/16	33·0	6 1/4	12 11/16	**31/–**	**60/–**
1 3/8	35·0	6 5/16	12 13/16	**34/–**	**66/–**
1 7/16	36·5	6 7/16	13	**37/–**	**72/–**
1 1/2	38·0	6 1/2	13 1/8	**40/–**	**79/–**
1 9/16	40·0	6 1/2	13 1/8	**45/–**	**88/–**
1 5/8	41·0	6 1/2	13 1/8	**50/–**	**98/–**
1 11/16	42·5	6 3/4	13 7/16	**55/–**	**108/–**
		Morse Taper Shank No. 5.			
1 3/4	44·5	6 3/4	14 11/16	**60/–**	**126/–**
1 13/16	46·0	6 3/4	14 11/16	**65/–**	**133/–**
1 7/8	47·5	7	15	**70/–**	**144/–**
1 15/16	49·0	7	15	**75/–**	**155/–**
2	50·0	7	15	**80/–**	**162/–**
2 1/16	52·0	7 1/4	15 1/2	**86/–**	**181/–**
2 1/8	54·0	7 1/4	15 1/2	**91/–**	**194/–**
2 3/16	55·5	7 1/4	15 1/2	**96/–**	**202/–**
2 1/4	57·0	7 1/4	15 1/2	**102/–**	**213/–**
2 5/16	58·5	7 1/2	16	**109/–**	**228/–**
2 3/8	60·0	7 1/2	16	**115/–**	**240/–**
2 7/16	62·0	7 1/2	16	**121/–**	**255/–**
2 1/2	63·5	7 1/2	16	**127/–**	**270/–**

COMBINED REAMER AND COUNTERSINK FOR PLATE WORK.

High Speed Steel.

Fig. 131. ANGLE OF COUNTERSINK, 60 degrees.



Morse taper shank.	Diameter of reamer. A	Length of reamer. Part B	Length of parallel. Part C	Length of countersink D	Length of recess E	Diameter at point F	Total length	Price each.
No. 2	5/8	4	5/8	21/32	1/4	5/16	8 5/8	**40/–**
No. 2	11/16	4	11/16	11/16	1/4	3/8	8 3/4	**40/–**
No. 3	3/4	4	3/4	23/32	1/4	7/16	9 1/4	**42/–**
No. 3	13/16	4	13/16	3/4	1/4	1/2	9 1/4	**44/–**
No. 3	7/8	4	7/8	25/32	1/4	9/16	9 3/8	**46/6**
No. 3	15/16	4	15/16	13/16	1/4	5/8	9 3/8	**49/–**
No. 3	1	4	1	27/32	1/4	11/16	9 3/8	**52/–**
No. 3	1 1/16	4	1 1/16	7/8	1/4	3/4	9 3/8	**55/–**
No. 3	1 1/8	4	1 1/8	29/32	1/4	13/16	9 1/2	**58/6**
No. 3	1 3/16	4	1 3/16	15/16	1/4	7/8	9 1/2	**65/–**
No. 3	1 1/4	4	1 1/4	31/32	1/4	15/16	9 1/2	**72/–**
No. 4	1 5/16	4	1 5/16	1	1/4	1	10 1/2	**89/–**

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REAMERS.

Fig. 132. THE "QUICK-SET" ADJUSTABLE C-BLADE REAMER.

Size	A	B	C	D	E	F
Expansion, inches	$^{15}/_{32}$–$^{17}/_{32}$	$^{17}/_{32}$–$^{19}/_{32}$	$^{19}/_{32}$–$^{21}/_{32}$	$^{21}/_{32}$–$^{23}/_{32}$	$^{23}/_{32}$–$^{25}/_{32}$	$^{25}/_{32}$–$^{27}/_{32}$
Length of cutting edge, inches	$1\frac{5}{8}$	$1^{13}/_{16}$	$2^{1}/_{16}$	$2^{3}/_{16}$	$2^{1}/_{2}$	$2\frac{5}{8}$
Price each	**18/9**	**18/9**	**19/9**	**19/9**	**21/–**	**21/–**
Price of blades, per set of 6	**7/6**	**7/6**	**7/6**	**7/6**	**8/9**	**8/9**

Size	G	H	I	J	K
Expansion, inches	$^{27}/_{32}$–$^{15}/_{16}$	$^{15}/_{16}$–$1^{1}/_{16}$	$1^{1}/_{16}$–$1^{3}/_{16}$	$1^{3}/_{16}$–$1^{11}/_{32}$	$1^{11}/_{32}$–$1\frac{1}{2}$
Length of cutting edge, inches	3	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{7}{8}$	$4\frac{1}{4}$
Price each	**23/–**	**24/3**	**29/3**	**33/6**	**42/–**
Price of blades, set of 6	**10/–**	**10/–**	**11/3**	**11/3**	**13/9**

Fig. 133.

"QUICK-SET" ADJUSTABLE 6-BLADE REAMERS.

Complete in cases.

Set No. 40	comprises	9 reamers	C, D, E, F, G, H, I, J, K,	capacity	$^{19}/_{32}$—$1\frac{1}{2}$ ...	**241/6**
Set No. 41	,,	5 ,,	E, F, G, H, I	,,	$^{23}/_{32}$—$1^{3}/_{16}$	**120/–**
Set No. 42	,,	6 ,,	C, D, E, F, G, H	,,	$^{19}/_{32}$—$1^{1}/_{16}$ ...	**128/6**
Set No. 44	,,	11 ,,	A, B, C, D, E, F, G, H, I, J, K,	capacity	$^{15}/_{32}$—$1\frac{1}{2}$	**279/–**

It is not necessary to return reamers when ordering new blades. All blades are interchangeable, and it is only necessary to insert them. They are ground to size and ready for immediate use.

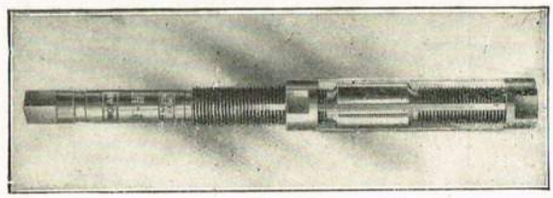

Fig. 134.

"WOTAN" BRITISH-MADE ADJUSTABLE REAMERS. (Critchley Pattern.)

How to adjust the blades of 5-fluted "Wotan" Reamers.

Ascertain the diameter of the adjusting nut (this gives the body size), and deduct the same from the actual diameter desired. Halve the result and add to former. The result will give the necessary dimension to which the blades should be set, the measurement being taken over body to edge of blade opposite.

Example :—If diameter of $^{25}/_{32}$″ (.7812) is required on a $\frac{3}{4}$ reamer, the body of which is .7405″.

Deduct the latter from former =	.7812	
	.7405	
		.0407
Halve the result =		.0203
Add this to the measurement of body of the tool being used :— in this case a $\frac{3}{4}$″ =		.7405
The reading by micrometer of tool must be measured over body to edge of blade, when desiring to set blades for $^{25}/_{32}$″ diameter holes.		.7608

Size	A	AA	B	C	D	E	F	G
Expansion, inches	$^{15}/_{32}$–$^{17}/_{32}$	$^{17}/_{32}$–$^{9}/_{16}$	$^{9}/_{16}$–$\frac{5}{8}$	$\frac{5}{8}$–$^{11}/_{16}$	$^{11}/_{16}$–$\frac{3}{4}$	$\frac{3}{4}$–$^{27}/_{32}$	$^{13}/_{16}$–$\frac{7}{8}$	$^{27}/_{32}$–$^{31}/_{32}$
Length of cutting blades, inches	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{3}{4}$
Length over all, inches	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	7	7	8
Price each	**18/6**	**18/6**	**18/6**	**19/6**	**19/9**	**20/9**	**20/9**	**22/9**
Spare blades, each	**1/7**	**1/7**	**1/7**	**1/10**	**1/10**	**2/2**	**2/2**	**2/5**

Size	H	I	K	L	M	N	O
Expansion, inches	$^{31}/_{32}$–$1\frac{1}{8}$	$1\frac{1}{8}$–$1^{9}/_{32}$	$1^{9}/_{32}$–$1^{15}/_{32}$	$1^{15}/_{32}$–$1^{11}/_{16}$	$1^{11}/_{16}$–$1^{15}/_{16}$	$1^{15}/_{16}$–$2\frac{1}{4}$	$2\frac{1}{4}$–$2\frac{5}{8}$
Length cutting blades, inches	3	$3\frac{1}{4}$	$3\frac{3}{4}$	4	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{4}$
Length over all, inches	9	10	11	12	14	16	18
Price, each	**24/3**	**29/3**	**34/6**	**39/-**	**45/6**	**52/9**	**64/–**
Spare blades, each	**2/5**	**2/8**	**2/11**	**3/4**	**4/–**	**4/9**	**5/3**

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EXPANDING REAMERS.

Fig. 135. MORSE EXPANSION REAMER, No. 715.

Diam. Ins.	Price, Each.	Whole Length, Ins.	Length of Flutes, Ins.	Diam. Ins.	Price, Each.	Whole Length, Ins.	Length of Flutes, Ins.	Diam. Ins.	Price, Each.	Whole Length Ins.	Length of Flutes, Ins.
1/4	12/6	4	1 1/2	3/4	20/–	8	3 1/2	1 9/32	38/4	11	5
9/32	12/9	4	1 1/2	25/32	20/10	8	3 1/2	1 5/16	39/7	11	5
5/16	12/11	4	1 1/2	13/16	21/11	8	3 1/2	1 11/32	41/8	11	5
11/32	13/2	4	1 1/2	27/32	22/11	8	3 1/2	1 3/8	43/9	11 1/2	5 1/4
3/8	13/4	5	2	7/8	24/–	9	4	1 13/32	45/10	11 1/2	5 1/4
13/32	13/7	5	2	29/32	25/–	9	4	1 7/16	47/11	11 1/2	5 1/4
7/16	13/9	5	2	15/16	26/1	9	4	1 15/32	50/–	11 1/2	5 1/4
15/32	14/–	5	2	31/32	27/1	9	4	1 1/2	52/1	12	5 1/2
1/2	14/2	6	2 1/2	1	28/1	10	4 1/2	1 9/16	54/2	12	5 1/2
17/32	14/7	6	2 1/2	1 1/32	29/2	10	4 1/2	1 5/8	56/3	12 1/2	5 3/4
9/16	15/3	6	2 1/2	1 1/16	30/3	10	4 1/2	1 11/16	58/4	12 1/2	5 3/4
19/32	15/10	6	2 1/2	1 3/32	31/3	10	4 1/2	1 3/4	60/5	13	6
5/8	16/8	7	3	1 1/8	32/3	10 1/2	4 3/4	1 13/16	62/6	13	6
21/32	17/6	7	3	1 5/32	33/4	10 1/2	4 3/4	1 7/8	64/7	13 1/2	6 1/4
11/16	18/4	7	3	1 3/16	34/7	10 1/2	4 3/4	1 15/16	66/8	13 1/2	6 1/4
23/32	19/2	7	3	1 7/32	35/10	10 1/2	4 3/4	2	68/9	14	6 1/2
				1 1/4	37/1	11	5				

Limits of expansion recommended for these Reamers are as follows :—1/4 to 15/32 inch, ·005 inch ; 1/2 to 11/32 inch, ·008 inch ; 1 to 1 23/32 inches, ·010 inch ; 1 3/4 to 2 15/32 inches, ·012 inch ; 2 31/64 to 3 inches, ·015 inch. The guides to these Reamers are ground ·005 inch under size.

Fig. 136. MORSE EXPANSION REAMER, No. 716.

Millimetre Sizes.

Diam. m/m	Price, Each.	Whole Length, m/m	Length of Flutes, m/m	Diam. m/m	Price, Each.	Whole Length m/m	Length of Flutes, m/m	Diam. m/m	Price, Each.	Whole Length, m/m	Length of Flutes, m/m
6	12/6	102	38	21	22/11	203	89	36	47/11	292	133
7	12/9	102	38	22	24/–	229	102	37	50/–	292	133
8	13/2	102	38	23	25/–	229	102	38	52/1	305	140
9	13/4	127	51	24	26/1	229	102	39	54/2	305	140
10	13/7	127	51	25	28/2	254	114	40	55/3	305	140
11	13/9	127	51	26	29/2	254	114	41	56/3	317	146
12	14/2	127	51	27	30/3	254	114	42	57/4	317	146
13	14/7	152	63	28	32/4	267	121	43	59/5	317	146
14	15/3	152	63	29	33/4	267	121	44	60/5	330	152
15	15/10	152	63	30	34/7	267	121	45	61/6	330	152
16	17/6	178	76	31	37/1	267	121	46	62/6	330	152
17	18/4	178	76	32	38/4	279	127	47	64/7	343	159
18	19/2	178	76	33	39/7	279	127	48	65/8	343	159
19	20/–	203	89	34	41/8	279	127	49	66/8	343	159
20	21/11	203	89	35	45/10	292	133	50	67/9	343	159

Limits of expansion recommended for these Reamers are as follows :—6 to 12 m/m, ·005 inch ; 13 to 25 m/m, ·008 inch ; 26 to 44 m/m, ·010 inch ; 45 to 50 m/m, ·012 inch. The guides to these Reamers are ground ·005 inch under size.

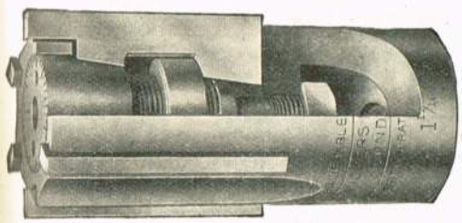

Fig. 137. VICKERS' ADJUSTABLE REAMER.

The Vickers' Adjustable Reamer consists of a steel shell, the hardened steel cone bolts and blades, and the retaining ring and lock nut on the cone bolt. The blades are well backed up at the sides, and the cutting face left clear. Each small division on the face of the cone belt equals 1/4000 inch variation in diameter and each large division 1/1000 inch.

Supplied with either carbon or high-speed steel blades.

Size. Ins.	Price, Each. Carbon.	Price, Each. High Speed.	Extra Blades. Price, per Set. Carbon.	Extra Blades. Price, per Set. High Speed.	Size. Ins.	Price, Each. Carbon.	Price, Each. High Speed.	Extra Blades. Price, per Set. Carbon.	Extra Blades. Price, per Set. High Speed.	Size. Ins.	Price, Each. Carbon.	Price, Each. High Speed	Extra Blades. Price, per Set. Carbon.	Extra Blades. Price, per Set. High Speed
1	20/–	22/3	7/9	10/–	1 11/16	30/–	32/6	10/6	13/–	2 3/8	41/6	45/–	14/3	17/9
1 1/16	20/3	22/6	8/–	10/3	1 3/4	31/3	33/9	10/6	13/–	2 7/16	42/6	46/–	14/3	17/9
1 1/8	20/6	22/9	8/3	10/6	1 13/16	32/3	35/3	11/6	14/6	2 1/2	43/6	47/–	14/3	17/9
1 3/16	20/9	23/–	8/3	10/6	1 7/8	33/3	36/3	11/6	14/6	2 9/16	44/6	48/6	16/9	20/9
1 1/4	22/–	24/3	8/3	10/6	1 15/16	34/3	37/3	11/6	14/6	2 5/8	45/9	49/9	16/9	20/9
1 5/16	23/–	25/3	8/3	10/6	2	35/3	38/3	11/6	14/6	2 11/16	47/9	51/9	16/9	20/9
1 3/8	24/3	26/6	9/6	11/9	2 1/16	36/6	39/6	12/6	15/6	2 3/4	50/–	54/–	16/9	20/9
1 7/16	25/6	27/9	9/6	11/9	2 1/8	37/6	40/6	12/6	15/6	2 13/16	52/–	56/9	18/9	23/6
1 1/2	26/9	29/–	9/6	11/9	2 3/16	38/6	41/6	12/6	15/6	2 7/8	54/3	59/–	18/9	23/6
1 9/16	27/9	30/3	10/6	13/–	2 1/4	39/6	42/6	12/6	15/6	2 15/16	56/3	61/–	18/9	23/6
1 5/8	29/–	31/6	10/6	13/–	2 5/16	40/6	44/4	14/3	17/9	3	58/3	63/–	18/9	23/6

Larger sizes and Reamers to millimetre dimensions also made. Prices on application.

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REAMERS.

Fig. 138. THREE-GROVE CHUCKING REAMERS.

Morse taper shank.

These reamers are designed specially for use when large holes are being made in solid stock. A two-groove drill is first used, the hole being then opened out with the three-groove reamer.

Diameter	Total length	Length of cut	No. of shank	High speed steel
1/4″	7″	3 11/16″	1	**10/–**
5/16″	7″	3 11/16″	1	**10/4**
3/8″	7″	3 11/16″	1	**10/9**
7/16″	7″	3 11/16″	1	**11/3**
1/2″	8″	4 11/16″	1	**12/7**
9/16″	8″	4 11/16″	1	**13/6**
5/8″	12 1/4″	8 7/16″	2	**18/–**
11/16″	12 1/4″	8 7/16″	2	**20/6**
3/4″	12 1/4″	8 7/16″	2	**23/–**
13/16″	12 1/4″	8 7/16″	2	**25/6**
7/8″	12 1/4″	8 7/16″	2	**28/–**
15/16″	13 1/4″	8 3/4″	3	**29/6**
1″	13 1/4″	8 3/4″	3	**31/–**
1 1/16″	13 1/4″	8 3/4″	3	**34/–**
1 1/8″	13 1/4″	8 3/4″	3	**37/–**
1 3/16″	13 1/4″	8 3/4″	3	**40/3**
1 1/4″	14 1/2″	9″	4	**43/6**
1 5/16″	14 1/2″	9″	4	**47/–**
1 3/8″	14 1/2″	9″	4	**50/6**
1 7/16″	14 1/2″	9″	4	**54/–**
1 1/2″	14 1/2″	9″	4	**58/–**
1 9/16″	14 1/2″	9″	4	**62/–**
1 5/8″	14 1/2″	9″	4	**66/6**
1 11/16″	14 1/2″	9″	4	**71/–**
1 3/4″	16″	9 1/4″	5	**79/–**
1 13/16″	16″	9 1/4″	5	**86/–**
1 7/8″	16″	9 1/4″	5	**93/–**
1 15/16″	16″	9 1/4″	5	**100/–**
2″	16″	9 1/4″	5	**108/–**
2 1/16″	16″	9 1/8″	5	**116/–**
2 1/8″	16″	9 1/8″	5	**124/–**
2 3/16″	16″	9 1/8″	5	**132/–**
2 1/4″	16″	8 3/4″	5	**140/–**
2 5/16″	16″	8 3/4″	5	**148/–**
2 3/8″	16 1/2″	9 1/8″	5	**155/8**
2 7/16″	16 1/2″	9 1/8″	5	**163/4**
2 1/2″	16 1/2″	9″	5	**170/–**
2 9/16″	16 1/2″	9″	5	**180/–**
2 5/8″	17″	9 3/8″	5	**190/–**
2 11/16″	17″	9 3/8″	5	**200/–**
2 3/4″	17″	9 1/4″	5	**210/–**
2 13/16	17 1/2″	9 3/4″	5	**220/–**
2 7/8″	17 1/2″	9 5/8″	5	**230/–**
2 15/16″	17 1/2″	9 5/8″	5	**240/–**
3″	17 1/2″	9 1/2″	5	**250/–**

Fig. 139. MACHINE JIG REAMERS.

Morse taper shank.

These reamers are intended for use on jig and special fixture work. The plain portion between the taper shank and cutting edges acts as a pilot, and is finished .0005″ below nominal diameter of cut.

Diam. of Reamer	Length of flutes.	Length of plain part.	Length overall	No. of shank	High speed steel.
1/4″	1 1/4″	2 3/16″	6″	1	**7/6**
5/16″	1 1/4″	2 3/16″	6″	1	**8/–**
3/8″	1 1/2″	2 15/16″	7″	1	**8/9**
7/16″	1 1/2″	2 15/16″	7″	1	**9/9**
1/2″	1 3/4″	3 11/16″	8″	1	**10/6**
9/16″	1 3/4″	3 11/16″	8″	1	**11/9**
5/8″	2″	3 7/8″	9″	2	**16/–**
11/16″	2″	3 7/8″	9″	2	**16/–**
3/4″	2 1/4″	4 1/8″	9 1/2″	2	**17/9**
13/16″	2 1/4″	4 1/8″	9 1/2″	2	**19/–**
7/8″	2 1/2″	4 3/8″	10″	2	**22/–**
15/16″	2 1/2″	3 5/8″	10″	3	**24/–**
1″	2 3/4″	3 7/8″	10 1/2″	3	**26/3**
1 1/16″	2 3/4″	3 7/8″	10 1/2″	3	**28/6**
1 1/8″	2 7/8″	4 1/4″	11″	3	**31/6**
1 3/16″	2 7/8″	4 1/4″	11″	3	**34/3**
1 1/4″	3″	4 5/8″	11 1/2″	3	**38/3**
1 5/16″	3″	3 5/8″	11 1/2″	4	**42/3**
1 3/8″	3 1/8″	4″	12″	4	**46/3**
1 7/16″	3 1/8″	4″	12″	4	**50/3**
1 1/2″	3 1/4″	4 3/8″	12 1/2″	4	**55/–**
1 9/16″	3 1/4″	4 3/8″	12 1/2″	4	**61/9**
1 5/8″	3 3/8″	4 3/4″	13″	4	**67/6**
1 11/16″	3 3/8″	4 3/4″	13″	4	**73/–**
1 3/4″	3 1/2″	4 5/8″	13″	4	**77/9**
1 13/16″	3 1/2″	4 5/8″	13″	4	**82/3**
1 7/8″	3 5/8″	5″	13 1/2″	4	**88/–**
1 15/16″	3 5/8″	5″	13 1/2″	4	**95/–**
2″	3 3/4″	5 1/8″	13 3/4″	4	**103/–**

Intermediate sizes take the same dimensions as the next larger standard diameter.

Sizes differing from this list are made to order, and prices forwarded upon application. Also made in Semi High Speed Steel at prices quoted upon application.

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REAMERS.

Fig. 140. Chucking Reamers with Straight Shanks. **Fig. 141. Chucking Reamers with Morse Taper Shanks.**

Diameter inches	Price each Straight shank £ s. d.	Price each Taper shank £ s. d.	Length over all—inches Straight shank	Length over all—inches Taper shank	Length of flute inches	Morse taper No.
1/4	0 5 9	0 7 6	5	6	1 1/4	1
9/32	0 6 0	0 7 9	5	6	1 1/4	1
5/16	0 6 3	0 8 0	5	6	1 1/4	1
11/32	0 6 6	0 8 6	6 1/4	7	1 1/2	1
3/8	0 7 0	0 9 3	6 1/4	7	1 1/2	1
13/32	0 7 6	0 9 6	6 1/4	7	1 1/2	1
7/16	0 8 0	0 9 9	6 1/4	7	1 1/2	1
15/32	0 8 6	0 10 0	7 1/2	8	1 3/4	1
1/2	0 9 0	0 10 3	7 1/2	8	1 3/4	1
17/32	0 9 6	0 11 0	7 1/2	8	1 3/4	1
9/16	0 10 0	0 11 9	7 1/2	8	1 3/4	1
19/32	0 10 9	0 13 9	8 1/4	9	2	2
5/8	0 11 6	0 14 9	8 1/4	9	2	2
21/32	0 12 3	0 15 6	8 1/4	9	2	2
11/16	0 13 0	0 15 9	8 1/4	9	2	2
23/32	0 13 9	0 16 6	8 3/4	9 1/2	2 1/4	2
3/4	0 15 0	0 17 9	8 3/4	9 1/2	2 1/4	2
25/32	0 16 0	0 18 6	8 3/4	9 1/2	2 1/4	2
13/16	0 17 3	0 19 6	8 3/4	9 1/2	2 1/4	2
27/32	0 18 3	1 0 6	9 1/2	10	2 1/2	2
7/8	0 19 6	1 1 6	9 1/2	10	2 1/2	2
29/32	1 0 6	1 2 9	8 3/4	10	2 1/2	3
15/16	1 1 9	1 4 0	8 3/4	10	2 1/2	3
31/32	1 3 0	1 4 6	9 1/4	10 1/2	2 3/4	3
1	1 4 0	1 5 9	9 1/4	10 1/2	2 3/4	3
1 1/32	1 5 3	1 8 0	9 1/4	10 1/2	2 3/4	3
1 1/16	1 6 3	1 9 3	9 1/4	10 1/2	2 3/4	3
1 3/32	1 7 6	1 10 3	10	11	2 7/8	3
1 1/8	1 8 6	1 12 0	10	11	2 7/8	3
1 5/32	1 10 3	1 13 9	10	11	2 7/8	3
1 3/16	1 12 0	1 15 0	10	11	2 7/8	3
1 7/32	1 13 9	1 16 6	10 1/2	11 1/2	3	3
1 1/4	1 15 6	1 19 0	10 1/2	11 1/2	3	3
1 9/32	1 17 3	2 1 0	9 1/2	11 1/2	3	4
1 5/16	1 19 0	2 2 3	9 1/2	11 1/2	3	4
1 11/32	2 0 6	2 4 6	10 1/4	12	3 1/8	4
1 3/8	2 2 3	2 6 3	10 1/4	12	3 1/8	4
1 13/32	2 4 6	2 9 0	10 1/4	12	3 1/8	4
1 7/16	2 6 9	2 11 0	10 1/4	12	3 1/8	4
1 15/32	2 9 6	2 14 3	10 3/4	12 1/2	3 1/4	4
1 1/2	2 12 0	2 17 3	10 3/4	12 1/2	3 1/4	4
1 17/32	2 12 0	3 0 0	10 3/4	12 1/2	3 1/4	4
1 9/16	2 17 9	3 2 3	10 3/4	12 1/2	3 1/4	4
1 19/32	3 0 6	3 4 6	11 1/2	13	3 3/8	4
1 5/8	3 3 6	3 7 6	11 1/2	13	3 3/8	4
1 21/32	3 6 3	3 10 3	11 1/2	13	3 3/8	4
1 11/16	3 12 0	3 12 6	11 1/2	13	3 3/8	4
1 23/32	3 12 0	3 14 3	11 1/2	13	3 1/2	4
1 3/4	3 15 0	3 16 6	11 1/2	13	3 1/2	4
1 25/32	3 18 0	3 19 0	11 1/2	13	3 1/2	4
1 13/16	4 1 0	4 1 6	11 1/2	13	3 1/2	4
1 27/32	4 3 6	4 3 6	12 1/4	13 1/2	3 5/8	4
1 7/8	4 7 0	4 7 6	12 1/4	13 1/2	3 5/8	4
1 29/32	4 10 6	4 11 6	12 1/4	13 1/2	3 5/8	4
1 15/16	4 14 0	4 15 6	12 1/4	13 1/2	3 5/8	4
1 31/32	4 17 6	4 18 6	12 1/2	13 3/4	3 3/4	4
2	5 1 0	5 1 6	12 1/2	13 3/4	3 3/4	4

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REAMERS AND END MILLS.

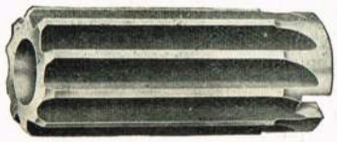

Fig. 142. Fluted Shell Pattern.

HIGH SPEED SHELL REAMERS.

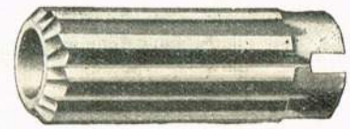

Fig. 143. Rose Shell Pattern.

Diam. inches	Price each £ s. d.	Length inches	Diam. of large end of hole inches	Diam. inches	Price each £ s. d.	Length inches	Diam. of large end of hole inches	Diam. inches	Price each £ s. d.	Length inches	Diam. of large end of hole inches
$\frac{1}{2}$	0 13 6	2	$\frac{1}{4}$	$1\frac{3}{8}$	1 10 9	3	$\frac{3}{4}$	$2\frac{1}{4}$	3 1 0	$3\frac{3}{4}$	$1\frac{1}{4}$
$\frac{9}{16}$	0 13 9	2	$\frac{1}{4}$	$1\frac{7}{16}$	1 12 0	3	$\frac{3}{4}$	$2\frac{5}{16}$	3 4 0	$3\frac{3}{4}$	$1\frac{1}{4}$
$\frac{5}{8}$	0 15 0	$2\frac{1}{4}$	$\frac{3}{8}$	$1\frac{1}{2}$	1 13 6	3	$\frac{3}{4}$	$2\frac{3}{8}$	3 6 0	$3\frac{3}{4}$	$1\frac{1}{4}$
$\frac{11}{16}$	0 15 6	$2\frac{1}{4}$	$\frac{3}{8}$	$1\frac{9}{16}$	1 14 6	3	$\frac{3}{4}$	$2\frac{7}{16}$	3 8 9	$3\frac{3}{4}$	$1\frac{1}{4}$
$\frac{3}{4}$	0 16 0	$2\frac{1}{2}$	$\frac{1}{2}$	$1\frac{5}{8}$	1 16 0	3	$\frac{3}{4}$	$2\frac{1}{2}$	3 10 6	$3\frac{3}{4}$	$1\frac{1}{4}$
$\frac{13}{16}$	0 16 3	$2\frac{1}{2}$	$\frac{1}{2}$	$1\frac{11}{16}$	2 1 6	$3\frac{1}{2}$	1	$2\frac{9}{16}$	3 18 9	4	$1\frac{1}{2}$
$\frac{7}{8}$	0 18 0	$2\frac{1}{2}$	$\frac{1}{2}$	$1\frac{3}{4}$	2 3 0	$3\frac{1}{2}$	1	$2\frac{5}{8}$	4 0 0	4	$1\frac{1}{2}$
$\frac{15}{16}$	0 19 3	$2\frac{1}{2}$	$\frac{1}{2}$	$1\frac{13}{16}$	2 4 3	$3\frac{1}{2}$	1	$2\frac{11}{16}$	4 5 0	4	$1\frac{1}{2}$
1	1 1 9	$2\frac{3}{4}$	$\frac{5}{8}$	$1\frac{7}{8}$	2 6 3	$3\frac{1}{2}$	1	$2\frac{3}{4}$	4 6 6	4	$1\frac{1}{2}$
$1\frac{1}{16}$	1 3 0	$2\frac{3}{4}$	$\frac{5}{8}$	$1\frac{15}{16}$	2 8 0	$3\frac{1}{2}$	1	$2\frac{13}{16}$	4 10 6	4	$1\frac{1}{2}$
$1\frac{1}{8}$	1 4 0	$2\frac{3}{4}$	$\frac{5}{8}$	2	2 9 0	$3\frac{1}{2}$	1	$2\frac{7}{8}$	4 12 3	4	$1\frac{1}{2}$
$1\frac{3}{16}$	1 5 0	$2\frac{3}{4}$	$\frac{5}{8}$	$2\frac{1}{16}$	2 15 0	$3\frac{3}{4}$	$1\frac{1}{4}$	$2\frac{15}{16}$	5 5 0	4	$1\frac{1}{2}$
$1\frac{1}{4}$	1 6 0	$2\frac{3}{4}$	$\frac{5}{8}$	$2\frac{1}{8}$	2 17 6	$3\frac{3}{4}$	$1\frac{1}{4}$	3	5 6 3	4	$1\frac{1}{2}$
$1\frac{5}{16}$	1 9 3	3	$\frac{3}{4}$	$2\frac{3}{16}$	3 0 0	$3\frac{3}{4}$	$1\frac{1}{4}$				

Fig. 144. ARBORS FOR SHELL REAMERS.

No.	Price each	Fitting sizes inches	Full length inches	No.	Price each	Fitting sizes inches	Full length inches	No.	Price each.	Fitting sizes inches.	Full length inches.
3	10/–	$\frac{1}{2}$ to $\frac{9}{16}$	8	7	15/–	$1\frac{5}{16}$ to $1\frac{5}{8}$	11	11	31/3	$3\frac{1}{16}$ to $3\frac{1}{2}$	15
4	11/3	$\frac{5}{8}$ to $\frac{11}{16}$	9	8	16/8	$1\frac{11}{16}$ to 2	12	12	43/9	$3\frac{9}{16}$ to 4	16
5	12/6	$\frac{3}{4}$ to $\frac{15}{16}$	$9\frac{1}{2}$	9	18/9	$2\frac{1}{16}$ to $2\frac{1}{2}$	13	13	56/3	$4\frac{1}{16}$ to $4\frac{1}{2}$	17
6	13/9	1 to $1\frac{1}{4}$	10	10	21/11	$2\frac{9}{16}$ to 3	14	14	75/–	$4\frac{9}{16}$ to 5	18

ARBORS FOR SOLID AND ADJUSTABLE SHELL REAMERS.

Fig. 145. Straight Shank Type.

Fig. 146. Morse Taper Shank Type.

Fitting sizes inches	Diam. of shank inches	Length of shank inches	Overall length inches	Price each
$\frac{1}{2}$ to $\frac{9}{16}$	$\frac{7}{16}$	$5\frac{1}{2}$	8	12/3
$\frac{5}{8}$ to $\frac{11}{16}$	$\frac{1}{2}$	$6\frac{5}{32}$	9	15/–
$\frac{3}{4}$ to $\frac{15}{16}$	$\frac{5}{8}$	$6\frac{11}{32}$	$9\frac{1}{2}$	18/9
1 to $1\frac{1}{4}$	$\frac{3}{4}$	$6\frac{15}{32}$	10	23/–
$1\frac{5}{16}$ to $1\frac{5}{8}$	$\frac{7}{8}$	$7\frac{5}{32}$	11	28/3
$1\frac{11}{16}$ to 2	$1\frac{1}{8}$	$7\frac{17}{32}$	12	35/9
$2\frac{1}{16}$ to $2\frac{1}{2}$	$1\frac{3}{8}$	$8\frac{7}{32}$	13	44/3
$2\frac{9}{16}$ to 3	$1\frac{5}{8}$	$8\frac{27}{32}$	14	55/3
$3\frac{1}{16}$ to $3\frac{1}{2}$	2	$9\frac{5}{32}$	15	67/3
$3\frac{9}{16}$ to 4	$2\frac{1}{8}$	$9\frac{15}{32}$	16	80/–

Fitting sizes inches	No. of shank	Overall length inches	Price each
$\frac{1}{2}$ to $\frac{9}{16}$	1	8	14/–
$\frac{5}{8}$ to $\frac{11}{16}$	1	9	16/9
$\frac{3}{4}$ to $\frac{15}{16}$	2	$9\frac{1}{2}$	20/9
1 to $1\frac{1}{4}$	2	10	25/–
$1\frac{5}{16}$ to $1\frac{5}{8}$	3	11	30/9
$1\frac{11}{16}$ to 2	3	12	38/–
$2\frac{1}{16}$ to $2\frac{1}{2}$	4	13	47/–
$2\frac{9}{16}$ to 3	4	14	58/–
$3\frac{1}{16}$ to $3\frac{1}{2}$	5	15	70/3
$3\frac{9}{16}$ to 4	5	16	83/–

Fig. 147.

HIGH SPEED END MILLS WITH STRAIGHT SHANK.

When ordering state whether Mills are required right or left hand.

Diameter, inches ...	...	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	1
Length of cut, inches ...	...	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{5}{8}$	$1\frac{3}{4}$
Total length, inches ...	...	$1\frac{7}{8}$	2	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{5}{8}$	$3\frac{3}{4}$
Shank diameter, inches	...	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Price—High speed steel	...	5/9	6/–	6/3	7/–	7/9	8/6	9/–	9/6	10/–	11/3	11/9	12/9	14/–	15/–	16/–

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REAMERS AND CUTTERS.

Fig. 148.

HIGH SPEED END MILLS. Morse Taper Shanks.

When ordering state whether Mills are required right or left hand, and if with straight or spiral teeth.

Diameter inches	No. of taper	Length of cut inches	Total length inches	High speed steel
$\frac{1}{4}$	1	$\frac{3}{4}$	$3\frac{3}{4}$	**7/–**
$\frac{5}{16}$	1	$\frac{7}{8}$	$3\frac{7}{8}$	**7/6**
$\frac{3}{8}$	1	$\frac{7}{8}$	$3\frac{7}{8}$	**8/–**
$\frac{7}{16}$	1	1	4	**8/6**
$\frac{1}{2}$	1	1	4	**9/–**
$\frac{9}{16}$	2	$1\frac{1}{8}$	$4\frac{3}{4}$	**12/–**
$\frac{5}{8}$	2	$1\frac{1}{4}$	$4\frac{7}{8}$	**13/–**
$\frac{11}{16}$	2	$1\frac{3}{8}$	5	**13/6**
$\frac{3}{4}$	2	$1\frac{1}{2}$	$5\frac{1}{8}$	**14/–**
$\frac{7}{8}$	2	$1\frac{5}{8}$	$5\frac{1}{4}$	**16/–**
1	3	$1\frac{3}{4}$	$6\frac{1}{8}$	**20/6**
$1\frac{1}{8}$	3	$1\frac{7}{8}$	$6\frac{1}{4}$	**23/6**
$1\frac{1}{4}$	3	2	$6\frac{3}{8}$	**28/–**
$1\frac{3}{8}$	4	$2\frac{1}{8}$	$7\frac{5}{8}$	**39/–**
$1\frac{1}{2}$	4	$2\frac{1}{4}$	7	**44/–**
$1\frac{5}{8}$	4	$2\frac{3}{8}$	$7\frac{7}{8}$	**51/–**
$1\frac{3}{4}$	4	$2\frac{3}{8}$	$7\frac{7}{8}$	**57/–**
$1\frac{7}{8}$	4	$2\frac{1}{2}$	8	**64/6**
2	4	$2\frac{1}{2}$	8	**73/–**

Fig. 149.

HIGH SPEED END MILLS, with Brown & Sharpe Taper Shanks.

When ordering state whether Mills are required right or left hand, and if with straight or spiral teeth.

Diameter inches	No. of taper	Length of cut inches	Total length inches	High speed steel
$\frac{1}{4}$	5	$\frac{3}{4}$	$3\frac{1}{2}$	**7/6**
$\frac{5}{16}$	5	$\frac{7}{8}$	$3\frac{5}{8}$	**8/–**
$\frac{3}{8}$	5	$\frac{7}{8}$	$3\frac{5}{8}$	**8/6**
$\frac{7}{16}$	5	1	$3\frac{3}{4}$	**8/6**
$\frac{1}{2}$	5	1	$3\frac{3}{4}$	**9/–**
$\frac{9}{16}$	7	$1\frac{1}{8}$	$5\frac{1}{4}$	**13/–**
$\frac{5}{8}$	7	$1\frac{1}{4}$	$5\frac{3}{8}$	**13/6**
$\frac{11}{16}$	7	$1\frac{3}{8}$	$5\frac{1}{2}$	**14/–**
$\frac{3}{4}$	7	$1\frac{1}{2}$	$5\frac{5}{8}$	**14/6**
$\frac{7}{8}$	7	$1\frac{5}{8}$	$5\frac{3}{4}$	**17/–**
1	9	$1\frac{3}{4}$	7	**24/–**
$1\frac{1}{8}$	9	$1\frac{7}{8}$	$7\frac{1}{8}$	**26/6**
$1\frac{1}{4}$	9	2	$7\frac{1}{4}$	**31/–**
$1\frac{3}{8}$	10	$2\frac{1}{8}$	$9\frac{3}{8}$	**41/–**
$1\frac{1}{2}$	10	$2\frac{1}{4}$	$9\frac{1}{2}$	**49/5**
$1\frac{5}{8}$	10	$2\frac{3}{8}$	$9\frac{5}{8}$	**58/–**
$1\frac{3}{4}$	10	$2\frac{3}{8}$	$9\frac{5}{8}$	**64/6**
$1\frac{7}{8}$	10	$2\frac{1}{2}$	$9\frac{3}{4}$	**73/–**
2	10	$2\frac{1}{2}$	$9\frac{3}{4}$	**82/6**

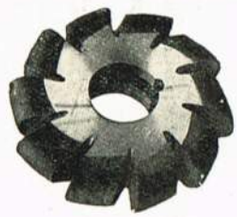

Fig. 150.

HIGH SPEED REAMER AND FLUTING CUTTERS.

Diameter of reamer inches	Do. of teeth	Diam. of cutter inches	Size of hole inches	High speed steel each
$\frac{1}{8}$ to $\frac{3}{16}$	6	2	1	**29/9**
over $\frac{3}{16}$ to $\frac{5}{16}$	6	2	1	**31/6**
,, $\frac{5}{16}$ to $\frac{7}{16}$	6	$2\frac{1}{4}$	1	**36/6**
,, $\frac{7}{16}$ to $\frac{11}{16}$	6 to 8	$2\frac{1}{4}$	1	**39/–**
,, $\frac{11}{16}$ to 1	8 to 10	$2\frac{3}{8}$	1	**43/9**
,, 1 to $1\frac{1}{2}$	10 to 12	$2\frac{1}{2}$	1	**47/9**
,, $1\frac{1}{2}$ to $2\frac{1}{8}$	12 to 14	$2\frac{5}{8}$	1	**54/–**
,, $2\frac{1}{8}$ to 3	12 to 16	$2\frac{7}{8}$	1	**61/–**
,, 3 to 4	14 to 18	$3\frac{1}{8}$	1	**67/6**

Fig. 151.

HIGH SPEED TAP GROOVING CUTTERS.

Diameter tap inches	Diameter cutter inches	Size of hole inches	High speed steel each
0 to $\frac{1}{8}$	2	1	**29/9**
$\frac{1}{8}$ to $\frac{1}{4}$	2	1	**31/6**
$\frac{1}{4}$ to $\frac{3}{8}$	$2\frac{1}{8}$	1	**36/6**
$\frac{3}{8}$ to $\frac{5}{8}$	$2\frac{1}{4}$	1	**39/–**
$\frac{5}{8}$ to $\frac{7}{8}$	$2\frac{3}{8}$	1	**43/9**
$\frac{7}{8}$ to $1\frac{1}{4}$	$2\frac{1}{2}$	1	**47/9**
$1\frac{1}{4}$ to $1\frac{5}{8}$	$2\frac{5}{8}$	1	**54/–**
$1\frac{5}{8}$ to 2	$2\frac{7}{8}$	1	**61/–**

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MILLING CUTTERS.

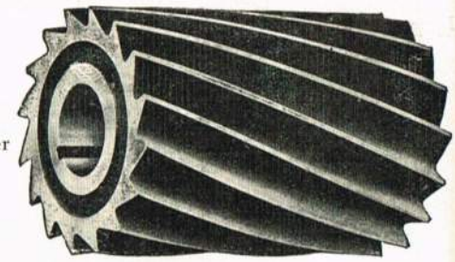
Fig. 152a.
HIGH-SPEED SLOT MILLING CUTTERS.

These Cutters are ground hollow to give clearance in cutting deep slots.
Cutters ½″ face and over have teeth of spiral form.
Prices of cutters varying in size from those below quoted upon application.
1″ holes in 2¼″, 3″, 3½″, 4″, 4½″ diam cutters.
1¼″ holes in 5″, 5½″, 6″ diameter cutters.

Fig. 152b.
HIGH-SPEED MILLING CUTTERS.

1″ holes ... 2½″ diameter cutter.
1¼″ holes ... 3″ and 3½″ diam. cutter
1¼″ or 1½″ holes 4″ diameter cutters.
1½″ or 2″ holes 4½″ diameter cutters.

Other hole sizes made to order.



Cylindrical Cutter.

Diam. ins.	Price £	s.	d.	Face ins.	Diam. ins.	Price £	s.	d.	Face ins.
2½	0	14	6	¼	4	2	6	0	¾
2½	0	15	6	5/16	4	2	8	0	13/16
2½	0	17	0	⅜	4	2	10	0	⅞
2½	0	18	6	7/16	4	2	12	0	15/16
2½	1	0	0	½	4	2	14	0	1
2½	1	2	0	9/16	4½	1	15	6	¼
2½	1	4	0	⅝	4½	1	17	6	5/16
2½	1	6	0	11/16	4½	2	0	3	⅜
2½	1	8	0	¾	4½	2	2	9	7/16
2½	1	10	0	13/16	4½	2	5	3	½
2½	1	11	9	⅞	4½	2	8	0	9/16
2½	1	13	6	15/16	4½	2	10	9	⅝
3	0	18	6	¼	4½	2	13	3	11/16
3	0	19	6	5/16	4½	2	15	9	¾
3	1	1	6	⅜	4½	2	18	3	13/16
3	1	3	0	7/16	4½	3	1	0	⅞
3	1	4	6	½	4½	3	3	6	15/16
3	1	6	0	9/16	4½	3	6	0	1
3	1	8	0	⅝	5	2	1	0	¼
3	1	9	6	11/16	5	2	4	0	5/16
3	1	11	0	¾	5	2	8	0	⅜
3	1	13	6	13/16	5	2	10	6	7/16
3	1	15	6	⅞	5	2	13	0	½
3	1	17	6	15/16	5	2	19	6	⅝
3½	1	3	9	¼	5	3	5	6	¾
3½	1	5	0	5/16	5	3	12	6	⅞
3½	1	6	9	⅜	5	3	19	0	1
3½	1	8	6	7/16	5½	2	8	0	¼
3½	1	10	3	½	5½	2	11	6	5/16
3½	1	12	0	9/16	5½	2	15	0	⅜
3½	1	13	9	⅝	5½	2	19	6	7/16
3½	1	15	6	11/16	5½	3	4	0	½
3½	1	17	3	¾	5½	3	10	9	⅝
3½	1	19	0	13/16	5½	3	17	9	¾
3½	2	1	0	⅞	5½	4	5	3	⅞
3½	2	3	0	15/16	5½	4	13	0	1
4	1	9	0	¼	6	2	15	0	¼
4	1	10	6	5/16	6	2	19	0	5/16
4	1	13	0	⅜	6	3	3	0	⅜
4	1	15	0	7/16	6	3	9	0	7/16
4	1	17	6	½	6	3	15	0	½
4	2	0	0	9/16	6	4	2	0	⅝
4	2	2	0	⅝	6	4	10	0	¾
4	2	4	0	11/16	6	4	18	0	⅞
					6	5	7	0	1

Diam. ins.	Price £	s.	d.	Face ins.	Diam. ins.	Price £	s.	d.	Face ins.	Diam. ins.	Price £	s.	d.	Face ins.
2½	1	15	6	1	3½	5	2	0	3	4½	17	17	0	8
2½	1	17	0	1⅛	3½	5	17	0	3½	4½	19	19	0	8
2½	1	18	6	1¼	3½	6	11	0	4	4½	22	1	0	10
2½	2	0	0	1⅜	3½	7	19	0	5	4½	24	3	0	11
2½	2	1	6	1½	3½	9	7	0	6	4½	26	5	0	12
2½	2	3	0	1⅝	3½	10	15	0	7	5	4	5	0	1⅛
2½	2	4	6	1¾	3½	12	3	0	8	5	4	11	0	1¼
2½	2	6	0	1⅞	3½	13	11	0	9	5	4	17	0	1¾
2½	2	7	6	2	3½	14	19	0	10	5	5	3	0	1½
2½	2	11	0	2¼	4	2	18	6	1⅛	5	5	9	0	1⅝
2½	2	14	6	2½	4	3	3	0	1¼	5	5	15	0	1¾
2½	2	18	6	2¾	4	3	7	6	1⅜	5	6	1	0	1⅞
2½	3	2	6	3	4	3	12	0	1½	5	6	6	0	2
2½	3	10	0	3½	4	3	16	6	1⅝	5	6	18	0	2¼
2½	3	17	6	4	4	4	1	6	1¾	5	7	10	0	2½
2½	4	12	6	5	4	4	5	6	1⅞	5	8	2	6	2¾
2½	5	8	0	6	4	4	10	0	2	5	8	15	0	3
3	2	0	0	1	4	4	19	0	2¼	5	10	0	0	3½
3	2	2	6	1⅛	4	5	8	0	2½	5	11	5	0	4
3	2	5	0	1¼	4	5	17	0	2¾	5	13	2	6	5
3	2	7	6	1⅜	4	6	6	0	3	5	16	0	0	6
3	2	10	0	1½	4	7	4	0	3½	5	18	10	0	7
3	2	12	6	1⅝	4	8	2	0	4	5	21	0	0	8
3	2	15	0	1¾	4	9	18	0	5	5	23	10	0	9
3	2	17	6	1⅞	4	11	14	0	6	5	26	0	0	10
3	3	0	0	2	4	13	10	0	7	5	28	10	0	11
3	3	6	0	2¼	4	15	6	0	8	5	31	0	0	12
3	3	12	0	2½	4	17	2	0	9	6	5	15	0	1⅛
3	3	17	6	2¾	4	18	18	0	10	6	6	3	0	1¼
3	4	2	0	3	4	20	14	0	11	6	6	11	0	1⅜
3	4	12	0	3½	4	22	10	0	12	6	6	19	0	1½
3	5	2	0	4	4½	3	11	0	1⅛	6	7	7	6	1⅜
3	6	3	0	5	4½	3	16	0	1¼	6	7	16	0	1¾
3	7	4	0	6	4½	4	1	0	1⅜	6	8	5	6	1⅞
3	8	5	0	7	4½	4	6	0	1½	6	8	15	0	2
3	9	6	0	8	4½	4	11	0	1⅝	6	9	11	0	2¼
3½	2	5	0	1	4½	4	16	0	1¾	6	10	7	0	2½
3½	2	8	6	1⅛	4½	5	1	6	1⅞	6	11	3	0	2¾
3½	2	12	0	1¼	4½	5	7	0	2	6	12	0	0	3
3½	2	15	6	1⅜	4½	5	17	0	2¼	6	13	14	0	3½
3½	2	19	0	1½	4½	6	6	6	2½	6	15	8	6	4
3½	3	2	6	1⅝	4½	6	16	6	2¾	6	18	16	0	5
3½	3	6	0	1¾	4½	7	6	0	3	6	22	4	0	6
3½	3	9	6	1⅞	4½	8	7	6	3½	6	25	12	0	7
3½	3	13	0	2	4½	9	9	0	4	6	29	0	0	8
3½	4	1	0	2¼	4½	11	11	0	5	6	32	8	0	9
3½	4	8	0	2½	4½	13	13	0	6	6	35	16	0	10
3½	4	15	0	2¾	4½	15	15	0	7	6	39	10	0	11
										6	43	0	0	12

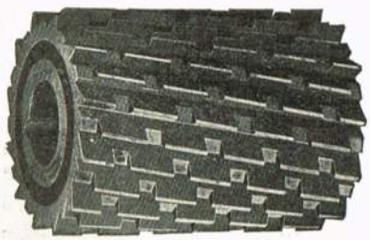


Fig. 152c. HIGH-SPEED MILLING CUTTERS WITH NICKED TEETH.

Specially adapted for taking heavy cuts, the nicked teeth breaking up the chips.
1″ holes ... 2½″ diameter cutters.
1¼″ holes ... 3″ and 3½″ diam. cutters.
1½″ holes ... 4″ and 4½″ and 5″ cutters.
2″ holes ... 5″ and 6″ cutters.
2½″ holes ... 6″ cutters.

Dia. ins.	Width of face ins.	High speed steel	Dia. ins.	Width of face ins.	High speed steel	Dia. ins.	Width of face ins.	High speed steel	Dia. ins.	Width of face ins.	High speed steel
2½	2½	54/6	3	8	186/–	4	3½	144/–	4½	4	189/–
2½	3	62/6	3½	2½	88/–	4	4	162/–	4½	5	231/–
2½	3½	70/–	3½	3	102/–	4	5	198/–	4½	6	273/–
2½	4	77/6	3½	3½	117/–	4	6	234/–	4½	7	315/–
2½	5	92/6	3½	4	131/–	4	7	270/–	4½	8	357/–
2½	6	108/–	3½	5	159/–	4	8	306/–	4½	9	399/–
3	2½	72/–	3½	6	187/–	4	9	342/–	4½	10	441/–
3	3	82/–	3½	7	215/–	4	10	378/–	4½	11	483/–
3	3½	92/–	3½	8	243/–	4	11	414/–	4½	12	525/–
3	4	102/–	3½	9	271/–	4	12	450/–	5	2½	150/–
3	5	123/–	3½	10	299/–	4½	2½	126/6	5	3	175/–
3	6	144/–	4	2½	108/–	4½	3	146/–	5	3½	200/–
3	7	165/–	4	3	126/–	4½	3½	167/6	5	4	225/–

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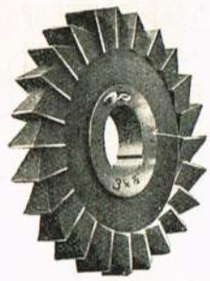
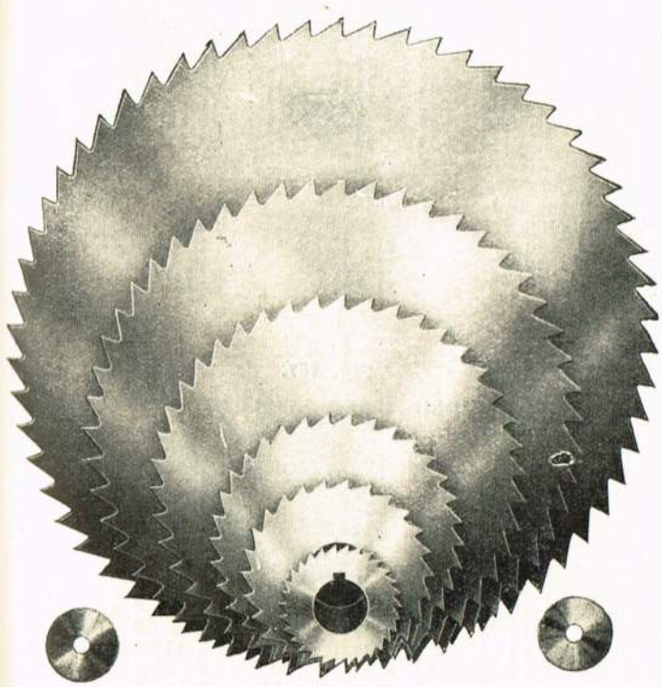
MILLING CUTTERS.



These Cutters are known as "Straddle Mills" when used in pairs.

Prices can be quoted for cutters varying in size from the list below.

1″ hole ... 2½″, 3″, 3½″, 4″ and 4½″ cutters.
1¼″ hole ... 5″ and 6″ cutters.



1″ holes ... 2½″, 3″, 4″, 5″, 6″, 7″, 8″ diameter.

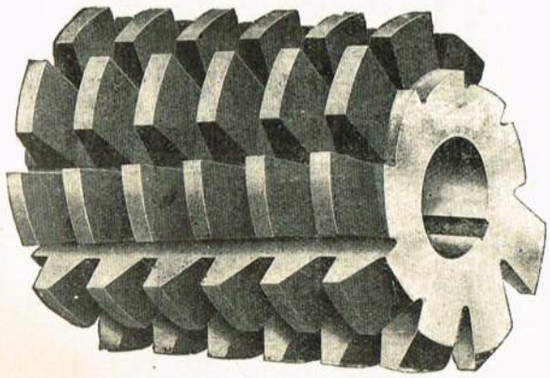


Fig. 152.
HIGH SPEED SIDE AND FACE CUTTERS.

Diam. ins.	Price £	s.	d.	Face ins.	Diam. ins.	Price £	s.	d.	Face ins.	Diam. ins.	Price £	s.	d.	Face ins.
2½	1	0	0	3/16	4	2	6	0	7/16	5½	3	19	6	⅝
2½	1	1	6	¼	4	2	8	6	½	5½	4	6	6	¾
2½	1	2	3	5/16	4	2	10	3	9/16	5½	4	14	0	⅞
2½	1	3	0	⅜	4	2	12	0	⅝	5½	5	1	6	1
2½	1	4	0	7/16	4	2	15	6	¾	6	3	14	0	¼
2½	1	5	0	½	4	2	19	0	⅞	6	3	16	0	5/16
2½	1	7	0	9/16	4	3	2	6	1	6	3	18	0	⅜
2½	1	9	0	⅝	4	3	13	0	1¼	6	4	0	0	7/16
2½	1	13	0	¾	4½	2	7	0	¼	6	4	2	0	½
2½	1	17	0	⅞	4½	2	8	6	5/16	6	4	6	0	9/16
2½	2	1	0	1	4½	2	10	0	⅜	6	4	10	0	⅝
3	1	5	0	3/16	4½	2	12	6	7/16	6	4	18	0	¾
3	1	6	0	¼	4½	2	15	9	½	6	5	7	0	⅞
3	1	7	0	5/16	4½	3	0	6	⅝	6	5	16	0	1
3	1	8	6	⅜	4½	3	5	3	¾	6	6	8	6	1⅛
3	1	9	6	7/16	4½	3	10	0	⅞	6	7	1	0	1¼
3	1	11	0	½	4½	3	16	0	1	6	8	6	0	1½
3	1	13	0	9/16	4½	4	6	0	1¼	7	5	8	0	½
3	1	15	0	⅝	5	2	19	0	¼	7	6	0	0	⅝
3	1	19	0	¾	5	3	0	0	5/16	7	6	12	0	¾
3	2	2	6	⅞	5	3	1	0	⅜	7	7	5	0	⅞
3	2	7	0	1	5	3	2	0	7/16	7	7	18	0	1
3½	1	11	6	3/16	5	3	3	0	½	7	8	11	0	1⅛
3½	1	10	6	¼	5	3	6	0	9/16	7	9	4	0	1¼
3½	1	12	6	5/16	5	3	9	0	⅝	7	10	10	6	1½
3½	1	14	6	⅜	5	3	15	0	¾	8	6	14	0	½
3½	1	16	6	7/16	5	4	1	0	⅞	8	7	9	0	⅝
3½	1	18	6	½	5	4	7	0	1	8	8	4	0	¾
3½	2	0	6	9/16	5	4	13	0	1⅛	8	9	0	0	⅞
3½	2	2	6	⅝	5	5	0	0	1¼	8	9	16	0	1
3½	2	6	6	¾	5	5	12	0	1½	8	10	10	0	1⅛
3½	2	10	3	⅞	5½	3	6	6	¼	8	11	4	0	1¼
3½	2	14	3	1	5½	3	8	0	5/16	8	12	3	0	1⅜
4	2	4	0	3/16	5½	3	9	6	⅜	8	13	2	0	1½
4	2	4	6	¼	5½	3	11	0	7/16	8	14	6	0	1¾
4	2	5	0	5/16	5½	3	12	6	½	8	15	10	0	2
4	2	5	6	⅜										

Fig. 153.
HIGH SPEED METAL SLITTING SAWS.

The sides are ground slightly concave to give sufficient clearance.

Diam. ins.	Price £	s.	d.	Face ins.	Diam. ins.	Price £	s.	d.	Face ins.	Diam. ins.	Price £	s.	d.	Face ins.
2½	0	6	3	1/32	3½	0	9	9	5/32	5½	0	16	0	1/16
2½	0	6	0	3/64	3½	0	11	0	3/16	5½	0	15	0	3/32
2½	0	5	9	1/16	4	0	12	0	1/32	5½	0	17	2	⅛
2½	0	6	3	5/32	4	0	10	0	3/64	5½	0	19	2	5/32
2½	0	6	9	⅛	4	0	8	6	1/16	5½	1	2	0	3/16
2½	0	7	6	5/32	4	0	9	6	3/32	6	0	18	0	1/16
2½	0	8	0	3/16	4	0	10	6	⅛	6	0	16	6	3/32
3	0	7	3	1/32	4	0	11	6	5/32	6	0	19	3	⅛
3	0	6	6	3/64	4	0	13	0	3/16	6	1	1	3	5/32
3	0	6	3	1/16	4½	0	13	0	1/16	6	1	4	0	3/16
3	0	6	9	3/32	4½	0	11	6	3/32	7	1	7	6	1/16
3	0	7	3	⅛	4½	0	12	9	⅛	7	1	6	3	3/32
3	0	7	9	5/32	4½	0	14	3	5/32	7	1	4	6	⅛
3	0	8	3	3/16	4½	0	15	9	3/16	7	1	8	6	5/32
3½	0	9	8	1/32	5	0	14	0	1/16	7	1	8	6	3/16
3½	0	8	3	3/64	5	0	13	6	3/32	8	1	10	0	⅛
3½	0	7	5	1/16	5	0	15	0	⅛	8	1	13	9	5/32
3½	0	8	2	3/32	5	0	17	0	5/32	8	1	18	0	3/16
3½	0	9	0	⅛	5	0	18	6	3/16	8	2	7	6	¼

Fig. 154.
HIGH SPEED WORM GEAR HOBS.

As there is no generally accepted list of sizes of Hobs, we are not able to issue prices, but are glad to quote on receipt of particulars.

To enable us to submit prices, the following information should be given :—

Number of teeth in worm wheel.
Outside diameter of worm.
Size of hole in hob.
Size of keyway.
Lead, *i.e.*, the advance to one turn.
Number of threads, single, double, etc.

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GEAR CUTTERS.

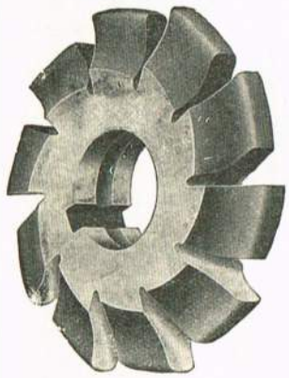

Fig. 155. HIGH SPEED INVOLUTE GEAR CUTTERS.

Diametral pitch	Price each £ s. d.	Diam. of cutter ins.	Hole ins.	Diametral pitch	Price each £ s. d.	Diam. of cutter ins.	Hole ins.	Diametral pitch	Price each £ s. d.	Diam. of cutter ins.	Hole ins.
48	1 7 3	2¼	1	5	2 18 6	3⅜	1	3½	4 14 6	4⅞	1½
44	1 7 3	2¼	1	4½	3 5 3	3⅝	1	3¼	5 6 3	5	1½
40	1 7 3	2¼	1	4	3 10 6	3¾	1	3	5 12 6	5⅛	1½
38	1 7 3	2¼	1	12	1 14 9	2⅞	1¼	2¾	6 11 3	5¼	1½
36	1 7 3	2¼	1	11	1 14 9	2⅞	1¼	2½	7 9 0	5½	1½
34	1 7 3	2¼	1	10	1 18 6	3	1¼	2¼	8 8 6	5¾	1½
32	1 7 3	2¼	1	9	1 18 6	3	1¼	2	8 19 0	5¾	1½
30	1 7 3	2¼	1	8	2 2 3	3¼	1¼	6	2 18 6	4¼	1¾
28	1 7 3	2¼	1	7	2 4 6	3⅜	1¼	5½	3 6 3	4½	1¾
26	1 7 3	2¼	1	6	2 10 0	3½	1¼	5	3 12 0	4½	1¾
24	1 7 3	2¼	1	5½	2 17 3	3¾	1¼	4½	4 1 3	4¾	1¾
22	1 7 3	2¼	1	5	3 1 3	3¾	1¼	4	4 11 6	5	1¾
20	1 8 6	2⅜	1	4½	3 8 9	4	1¼	3¾	4 18 0	5⅛	1¾
18	1 8 6	2⅜	1	4	3 17 3	4¼	1¼	3½	5 5 0	5¼	1¾
16	1 9 9	2½	1	3¾	4 4 9	4⅜	1¼	3¼	5 17 6	5⅜	1¾
15	1 10 3	2½	1	3½	4 11 0	4½	1¼	3	6 6 9	5½	1¾
14	1 10 3	2½	1	3¼	4 19 3	4⅝	1¼	2¾	7 4 9	5¾	1¾
13	1 12 0	2⅝	1	3	5 6 9	4¾	1¼	2½	8 8 3	6	1¾
12	1 12 3	2⅝	1	8	2 6 0	3⅝	1½	2¼	9 18 9	6½	1¾
11	1 13 6	2⅝	1	7	2 10 3	3¾	1½	2	11 3 6	6½	1¾
10	1 14 6	2¾	1	6	2 13 9	3⅞	1½	1¾	12 4 6	6½	1¾
9	1 16 6	2¾	1	5½	3 1 6	4⅛	1½	1½	15 2 3	7	1¾
8	1 19 0	2⅞	1	5	3 5 9	4⅛	1½	1¾	13 18 0	7	2
7	2 2 0	3	1	4½	3 14 3	4⅜	1½	1½	17 1 0	7½	2
6	2 4 3	3⅛	1	4	4 3 6	4⅝	1½	1¼	19 15 9	7¾	2
5½	2 14 0	3⅜	1	3¾	4 8 9	4¾	1½	1	33 17 0	8½	2

Diametral pitch	Price each	Diam. of cutter inches	Hole inches		Diametral pitch	Price each	Diam. of cutter inches	Hole inches
24	£1 5 0	1¾	⅞	...	14	£1 7 6	2⅛	⅞
20	£1 6 0	2	⅞	...	12	£1 8 9	2¼	⅞
18	£1 6 0	2	⅞	...	10	£1 10 0	2⅜	⅞
16	£1 7 6	2⅛	⅞	...				

Fig. 156.

HIGH SPEED CIRCULAR PITCH INVOLUTE CUTTERS.

Circular pitch ins.	Price each £ s. d.	Diam. of cutter ins.	Hole ins.	Circular pitch ins.	Price each £ s. d.	Diam. of cutter ins.	Hole ins.
⅛	1 7 3	2¼	1	11/16	3 14 3	4¾	1½
3/16	1 9 9	2½	1	¾	4 3 6	4⅝	1½
¼	1 12 3	2⅝	1	13/16	4 8 9	4¾	1½
5/16	1 14 6	2¾	1	⅞	4 14 6	4⅞	1½
⅜	1 19 0	2⅞	1	15/16	5 6 3	5	1½
7/16	2 2 0	3	1	1	5 12 6	5⅛	1½
½	2 4 3	3⅛	1	1⅛	6 11 3	5¼	1½
9/16	2 14 0	3⅜	1	1¼	7 9 0	5½	1½
⅝	2 18 6	3⅜	1	1⅜	8 8 6	5¾	1½
11/16	3 5 3	3⅝	1	1½	8 19 0	5¾	1½
¾	3 10 6	3¾	1	½	2 18 6	4¼	1¾
¼	1 14 9	2⅞	1¼	9/16	3 6 3	4½	1¾
5/16	1 18 6	3	1¼	⅝	3 12 0	4½	1¾
⅜	2 2 3	3¼	1¼	11/16	4 1 3	4¾	1¾
7/16	2 4 6	3⅜	1¼	¾	4 11 6	5	1¾
½	2 10 0	3½	1¼	13/16	4 18 0	5⅛	1¾
9/16	2 17 3	3¾	1¼	⅞	5 5 0	5¼	1¾
⅝	3 1 3	3¾	1¼	15/16	5 17 6	5⅜	1¾
11/16	3 8 9	4	1¼	1	6 6 9	5½	1¾
¾	3 17 3	4¼	1¼	1⅛	7 4 9	5¾	1¾
13/16	4 4 9	4⅜	1¼	1¼	8 8 3	6	1¾
⅞	4 11 0	4½	1¼	1⅜	9 18 9	6½	1¾
15/16	4 19 3	4⅝	1¼	1½	11 3 6	6½	1¾
1	5 6 9	4¾	1¼	1¾	12 4 6	6½	1¾
⅜	2 6 0	3⅝	1½	2	15 2 3	7	1¾
7/16	2 10 3	3¾	1½	1¾	13 18 0	7	2
½	2 13 0	3⅞	1½	2	17 1 0		2
9/16	3 1 6	4⅛	1½				
⅝	3 5 9	4⅛	1½				

Fig. 157.

METRIC HIGH SPEED INVOLUTE CUTTERS.

Module m/m.	Price each £ s. d.	Diam. ins.	Hole ins.	Module m/m	Price each £ s. d.	Diam ins.	Hole ins.
½	1 7 3	2¼	1				
¾	1 7 3	2¼	1	8	5 6 9	4¾	1¼
1	1 7 3	2¼	1	3	2 6 0	3⅝	1½
1¼	1 8 6	2⅜	1	3½	2 10 3	3¾	1½
1½	1 9 9	2½	1	4	2 13 9	3⅞	1½
1¾	1 10 3	2½	1	4½	3 1 6	4⅛	1½
2	1 12 3	2⅝	1	5	3 5 9	4⅛	1½
2¼	1 13 6	2⅝	1	5½	3 14 3	4⅜	1½
2½	1 14 6	2¾	1	6	4 3 6	4⅝	1½
2¾	1 16 6	2¾	1	7	4 14 6	4⅞	1½
3	1 19 0	2⅞	1	8	5 12 6	5⅛	1½
3½	2 2 0	3	1	9	6 11 3	5¼	1½
4	2 4 3	3⅛	1	10	7 9 0	5½	1½
4½	2 14 0	3⅜	1	11	8 8 6	5¾	1½
5	2 18 6	3⅜	1	12	8 19 0	5¾	1½
5½	3 5 3	3⅝	1	4	2 18 6	4¼	1¾
6	3 10 6	3¾	1	4½	3 6 3	4½	1¾
2	1 14 9	2⅞	1¼	5	3 12 0	4½	1¾
2¼	1 4 9	2⅞	1¼	5½	4 1 3	4¾	1¾
2½	1 18 6	3	1¼	6	4 11 6	5	1¾
2¾	1 18 6	3	1¼	7	5 5 0	5¼	1¾
3	2 2 3	3¼	1¼	8	6 6 9	5½	1¾
3½	2 4 6	3⅜	1¼	9	7 4 9	5¾	1¾
4	2 10 0	3½	1¼	10	8 8 3	6	1¾
4½	2 17 3	3¾	1¼	11	9 18 9	6½	1¾
5	3 1 3	3¾	1¼	12	11 3 6	6½	1¾
6	3 8 9	4	1¼	14	12 4 6	6½	1¾
7	3 17 3	4¼	1¼	16	15 2 3	7	1¾
	4 11 0	4½	1¼	14	13 18 0	7	2
				16	17 1 0	7½	2

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CUTTERS.

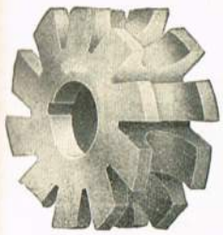

Fig. 158.
Concave.

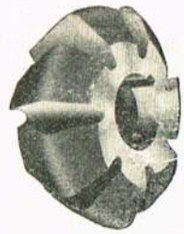

Fig. 159.
Convex.

Fig. 159. HIGH-SPEED CONVEX AND Fig. 158 CONCAVE CUTTERS.

Diam. of circle. ins.	Convex. Price each £ s. d.	Concave. Price each £ s. d.	Diam. of cutter. ins.	Size of hole ins.	Diam. of circle. ins.	Convex. Price each £ s. d.	Concave. Price each £ s. d.	Diam. of cutter. ins.	Size of hole ins.
1/8	1 9 6	1 13 6	2	7/8	9/16	2 8 6	2 19 0	2 3/4	1
1/8	1 9 6	1 13 6	2 1/4	1	5/8	2 11 0	3 0 6	2 3/4	1
3/16	1 10 6	1 15 0	2	7/8	11/16	2 14 0	3 5 0	3	1
3/16	1 10 6	1 15 0	2 1/4	1	3/4	2 16 0	3 11 6	3	1
1/4	1 12 0	1 17 6	2	7/8	13/16	2 19 6	4 0 0	3 1/4	1
1/4	1 12 0	1 17 6	2 1/4	1	7/8	3 1 6	4 2 0	3 1/4	1
5/16	1 16 0	2 1 6	2 1/4	7/8	15/16	3 6 0	4 11 6	3 1/2	1
5/16	1 16 0	2 1 6	2 1/2	1	1	3 8 0	4 14 0	3 1/4	1
3/8	1 17 6	2 4 0	2 1/4	7/8	1	3 8 0	4 14 0	3 1/2	1
3/8	1 17 6	2 4 0	2 1/2	1	1 1/8	4 6 6	5 14 6	4	1 1/4
7/16	1 19 6	2 7 0	2 1/4	7/8	1 1/4	4 12 0	6 2 0	4	1 1/4
7/16	1 19 6	2 7 0	2 1/2	1	1 3/8	5 2 6	6 18 0	4 1/4	1 1/4
1/2	2 2 0	2 9 6	2 1/4	7/8	1 1/2	5 8 0	7 8 0	4 1/4	1 1/4
1/2	2 2 0	2 9 6	2 1/2	1					

Fig. 160.
Single Right Hand.

Fig. 161.
Double.

These Cutters are relieved on top and side, and can be sharpened without changing form.
Supplied right or left hand.

Fig. 160/1. HIGH-SPEED SINGLE AND DOUBLE CORNER-ROUNDING CUTTERS.

Radius of circle. ins.	Single Price each. £ s. d.	Double Price each. £ s. d.	Diam. of cutter. ins.	Thickness Single. ins.	Thickness Double. ins.	Hole ins.
1/16	1 6 0	1 16 0	2 1/4	5/16	7/16	1
3/32	1 6 0	1 16 0	2 1/4	5/16	7/16	1
1/8	1 6 0	1 16 0	2 1/4	5/16	7/16	1
5/32	1 11 0	2 3 0	2 1/2	7/16	5/8	1
3/16	1 11 0	2 3 0	2 1/2	7/16	5/8	1
7/32	1 14 6	2 8 6	2 1/2	1/2	3/4	1
1/4	1 14 6	2 8 6	2 1/2	1/2	3/4	1
9/32	2 0 0	2 16 6	2 3/4	5/8	15/16	1
5/16	2 0 0	2 16 6	2 3/4	5/8	15/16	1
11/32	2 5 6	3 5 0	3	11/16	1 1/16	1
3/8	2 5 6	3 5 0	3	11/16	1 1/16	1
13/32	2 11 6	3 14 0	3 1/4	3/4	1 3/16	1
7/16	2 11 6	3 14 0	3 1/4	3/4	1 3/16	1
15/32	2 18 6	4 5 0	3 1/2	7/8	1 3/8	1
1/2	2 18 6	4 5 0	3 1/2	7/8	1 3/8	1
9/16	3 6 6	4 17 6	3 1/2	1	1 5/8	1
5/8	3 6 6	4 17 6	3 1/2	1	1 5/8	1
11/16	3 15 6	5 12 0	3 3/4	1 1/8	1 7/8	1
3/4	3 15 6	5 12 0	3 3/4	1 1/8	1 7/8	1

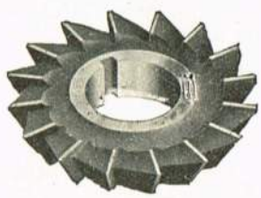

Fig. 162. HIGH-SPEED EQUAL ANGLE CUTTERS.

Standard 45°, 60° or 90° included angle.

Diameter	Thickness	Hole	High-speed steel
2 3/4"	1/2"	1"	**27/9**
3"	1/2"	1 1/4"	**32/3**

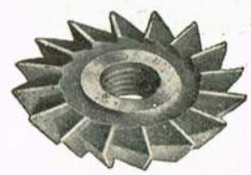

Fig. 163. HIGH-SPEED ANGLE CUTTERS.

With threaded holes.
These are made both right and left hand and with angles to order.

Diam.	Thickness	Hole	Thread	Semi high-speed steel	High-speed steel
1 1/4"	7/16"	3/8"	20 L. or R. hand	**15/–**	**16/–**
1 5/8"	9/16"	1/2"	16 ,,	**17/3**	**18/6**

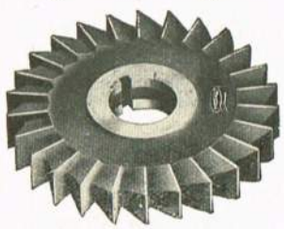

Fig. 164. HIGH-SPEED SINGLE-ANGLE CUTTERS.

Standard 45°, 50°, 60°, 70° or 80° angle, both right and left hand, suitable for cutting the teeth of cutters and mills.

Diameter	Thickness	Hole	High-speed steel
2 3/4"	1/2"	1"	**28/3**
3"	1/2"	1 1/4"	**32/9**

State whether Cutters are required right or left hand when ordering.

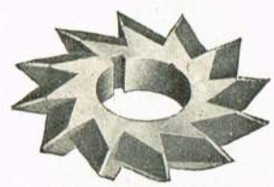

Fig. 165. HIGH-SPEED DOUBLE-ANGLE CUTTERS.

Standard 48°, 53°, 58°, 63°, 68°. or 73° angle on one side, and 12° on the other.

Diameter	Thickness	Hole	High-speed steel
2 3/4"	5/8"	1"	**31/3**
3"	3/4"	1 1/4"	**37/3**

State whether Cutters are required right or left hand when ordering.

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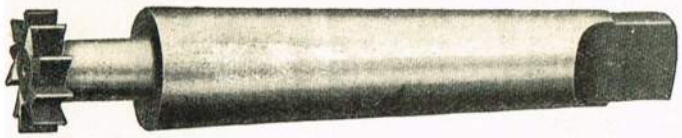
KEYWAY CUTTERS, Etc.



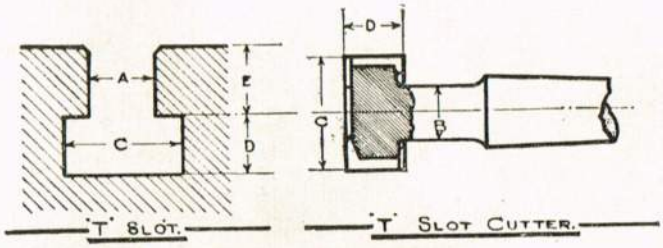


Fig. 166. HIGH SPEED T-SLOT CUTTERS with Morse or Brown & Sharpe Taper Shanks.

Where a special degree of strength is necessary in slots, cutters can be supplied to order with radiused corners. Right-hand cutters will be supplied unless otherwise specified.

Nom. size of Bolt *or* A	Width of top of slot	Diam. of neck of cutter B	Width of slot and diam. of cutter C	Depth of slot and width of cutter D	Length of neck of cutter E	Morse taper	Brown and Sharpe taper	High speed steel.
inches	inches	inches	inches	inches	inches			each
$\frac{1}{4}$	$^{9}/_{32}$	$^{7}/_{32}$	$^{19}/_{32}$	$^{7}/_{32}$	$\frac{1}{2}$	1	5	**12/–**
$^{5}/_{16}$	$^{11}/_{32}$	$^{9}/_{32}$	$^{21}/_{32}$	$\frac{1}{4}$	$^{21}/_{32}$	1	5	**13/–**
$\frac{3}{8}$	$^{7}/_{16}$	$^{11}/_{32}$	$^{25}/_{32}$	$^{9}/_{32}$	$^{11}/_{16}$	1	5	**15/6**
$^{7}/_{16}$	$\frac{1}{2}$	$\frac{3}{8}$	$^{29}/_{32}$	$^{11}/_{32}$	$\frac{3}{4}$	1	5	**18/6**
$\frac{1}{2}$	$^{9}/_{16}$	$^{7}/_{16}$	$1^{1}/_{16}$	$^{13}/_{32}$	$\frac{7}{8}$	2*	7	**23/6**
$\frac{5}{8}$	$^{11}/_{16}$	$^{17}/_{32}$	$1^{3}/_{16}$	$^{17}/_{32}$	1	2*	7	**28/6**
$\frac{3}{4}$	$^{13}/_{16}$	$^{21}/_{32}$	$1^{7}/_{16}$	$^{21}/_{32}$	$1\frac{1}{8}$	3*	9	**37/6**
$\frac{7}{8}$	$^{15}/_{16}$	$^{25}/_{32}$	$1^{11}/_{16}$	$^{25}/_{32}$	$1\frac{3}{8}$	3*	9	**49/6**
1	$1^{1}/_{16}$	$^{29}/_{32}$	$1\frac{7}{8}$	$^{29}/_{32}$	$1\frac{1}{2}$	4*	10	**65/6**
$1\frac{1}{8}$	$1^{3}/_{16}$	1	$2\frac{1}{8}$	$1^{1}/_{16}$	$1\frac{5}{8}$	4*	10	**77/6**
$1\frac{1}{4}$	$1^{5}/_{16}$	$1\frac{1}{8}$	$2^{5}/_{16}$	$1^{3}/_{16}$	$1\frac{3}{4}$	4*	10	**89/6**
$1\frac{3}{8}$	$1^{7}/_{16}$	$1\frac{1}{4}$	$2\frac{1}{2}$	$1^{5}/_{16}$	2	5*	12	**119/–**
$1\frac{1}{2}$	$1^{9}/_{16}$	$1\frac{3}{8}$	$2\frac{3}{4}$	$1^{7}/_{16}$	$2\frac{1}{8}$	5*	12	**142/6**

* Screwed hole.

Fig. 167. HIGH SPEED STANDARD SLOT DRILLS with Morse Taper and Brown & Sharpe Taper Shanks.

These End Mills are suitable for the rapid milling of slots from the solid. A high speed should be maintained to obtain the best results. When ordering, please state whether right or left hand tools are required.

Diameter of cutting part, inches	$\frac{1}{8}$	$^{5}/_{32}$	$^{3}/_{16}$	$\frac{1}{4}$	$^{5}/_{16}$	$\frac{3}{8}$	$^{7}/_{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Length of cut, inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
Morse taper, length over all, inches ...	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{7}{8}$	$4\frac{5}{8}$	$4\frac{7}{8}$	$5\frac{1}{8}$	$6\frac{1}{8}$	$6\frac{3}{8}$	$7\frac{3}{4}$
Brown & Sharpe, length over all, inches ...	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$5\frac{1}{8}$	$5\frac{3}{8}$	$5\frac{5}{8}$	7	$7\frac{1}{4}$	$9\frac{1}{2}$
Morse taper	1	1	1	1	1	1	1	1	2	2	2	3	3	4
High speed steel ... ... Price each	**6/9**	**7/–**	**7/–**	**7/3**	**7/9**	**8/–**	**8/3**	**8/6**	**10/6**	**12/3**	**13/9**	**18/6**	**27/9**	**45/9**
Brown & Sharpe taper	5	5	5	5	5	5	5	5	7	7	7	9	9	10
High speed steel ... ... Price each	**6/9**	**7/–**	**7/6**	**7/9**	**8/–**	**8/3**	**8/6**	**8/9**	**12/3**	**14/6**	**16/6**	**22/–**	**30/6**	**45/6**

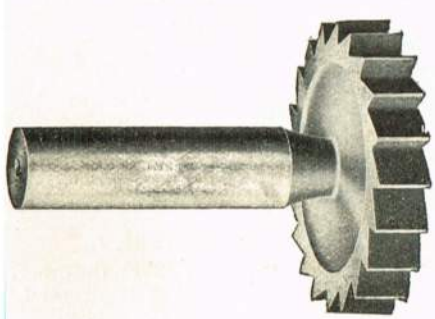


Fig. 168. HIGH-SPEED STEEL WOODRUFF KEY CUTTERS.

When ordering state whether right or left-hand cutters are required. All cutters are supplied with $\frac{1}{2}''$ shank. M.T. shanks to order.

No. of Cutter	1	2	3	4	5	6	7	8	9	10
Diameter, inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$
Thickness, inches	$^{1}/_{16}$	$^{3}/_{32}$	$\frac{1}{8}$	$^{3}/_{32}$	$\frac{1}{8}$	$^{5}/_{32}$	$\frac{1}{8}$	$^{5}/_{32}$	$^{3}/_{16}$	$^{5}/_{32}$
Price each ...	**6/3**	**6/3**	**6/3**	**7/6**	**7/6**	**7/6**	**8/6**	**8/6**	**8/6**	**10/–**

No. of Cutter	11	12	A	13	14	15	B	16	17	18	C
Diameter inches	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1	1	1	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
Thickness, inches	$^{3}/_{16}$	$^{7}/_{32}$	$\frac{1}{4}$	$^{3}/_{16}$	$^{7}/_{32}$	$\frac{1}{4}$	$^{5}/_{16}$	$^{3}/_{16}$	$^{7}/_{32}$	$\frac{1}{4}$	$^{5}/_{16}$
Price each ...	**10/–**	**10/–**	**10/–**	**12/–**	**12/–**	**12/–**	**12/–**	**14/6**	**14/6**	**14/6**	**14/6**

No. of Cutter	19	20	21	D	E	22	23	F	24	25	G
Diameter, inches	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Thickness, inches	$^{3}/_{16}$	$^{7}/_{32}$	$\frac{1}{4}$	$^{5}/_{16}$	$\frac{3}{8}$	$\frac{1}{4}$	$^{5}/_{16}$	$\frac{3}{8}$	$\frac{1}{4}$	$^{5}/_{16}$	$\frac{3}{8}$
Price each ...	**17/6**	**17/6**	**17/6**	**17/6**	**17/6**	**20/–**	**20/–**	**20/–**	**23/–**	**23/–**	**23/–**

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CHUCKS.

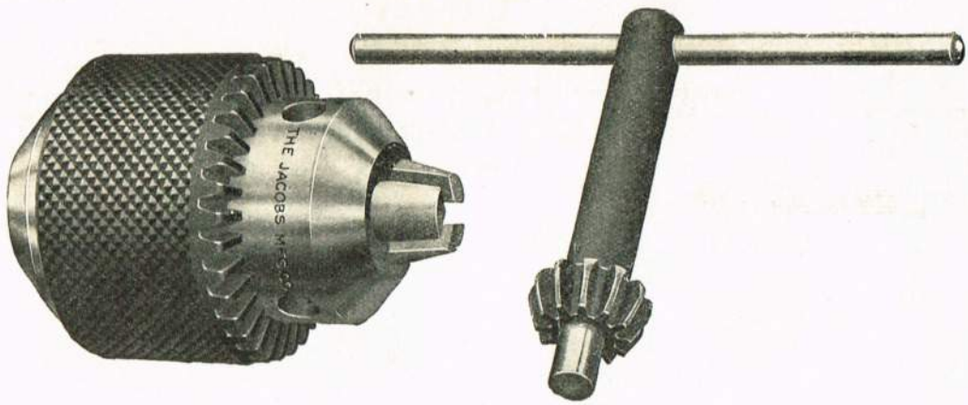

Fig. 169. JACOBS' IMPROVED DRILL CHUCKS. With Chamfer at back.

Prices and Dimensions of Regular Model.

No.	1	2	3	4	5	6
Holds drills inches	0 to $^{13}/_{64}$	0 to $^{21}/_{64}$	0 to $^{17}/_{32}$	$^{1}/_{16}$ to $\frac{3}{4}$	$\frac{3}{8}$ to 1	0 to $\frac{1}{2}$
Price each	**18/9**	**23/–**	**37/6**	**62/6**	**83/6**	**37/6**

Price of Flat Back Model.

No.	1A	2A	3A	6A
Price each	**18/9**	**23/–**	**37/6**	**37/6**

MORSE TAPER ARBORS FOR ABOVE.

Chuck Nos.	1, 1A, 2, 2A	3, 3A, 6, 6A	4	5
Morse Taper 1	**3/3**	**5/–**	**5/9**	**8/3**
,, ,, 2	**3/3**	**5/–**	**5/9**	**8/3**
,, ,, 3	**5/–**	**5/–**	**5/9**	**8/3**
,, ,, 4	**8/3**	**8/3**	**8/3**	**10/6**

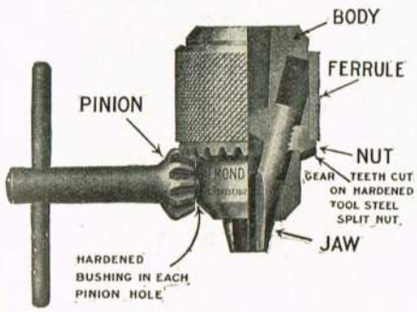

Fig. 170. ALMOND GEARED CHUCKS.

Powerful grip. Teeth cut on a hardened and tempered tool steel split-ring.

Chuck No.	5	7	9
Capacity, inches	up to $^{3}/_{16}$	up to $\frac{3}{8}$	up to $\frac{1}{2}$
Price each	**22/11**	**22/11**	**37/6**
Spare ferrules	**2/1**	**2/1**	**2/9**
Nuts	**2/1**	**2/1**	**2/9**
Jaws per set	**6/3**	**6/3**	**11/3**
Pinion key	**4/2**	**4/2**	**4/2**

Morse taper shank plugs—Plugs	1 and 2	3	4	5
Each	**4/2**	**5/3**	**6/3**	**8/4**

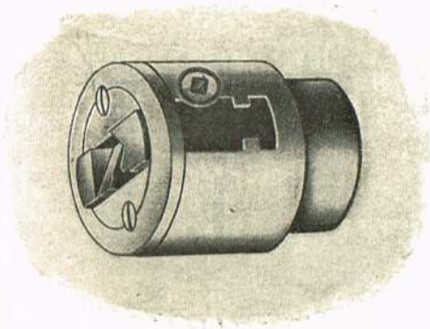

Fig. 171. TWO-JAW DRILL CHUCKS WITH KEY.

Well constructed, cheap, and really efficient chucks at a moderate cost. Fitted with large diameter screws and specially hardened steel jaws. Each chuck packed in a separate box.

Capacity of jaws, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Price each	**15/–**	**18/–**	**21/–**	**28/–**	**35/–**	**40/–**

Fig. 172. MILLERS FALLS THREE-JAW CHUCK.

With round shanks, **2½″ × ½″**.

Outside diameter, 1½″.

Price ... **12/5** each.

Fig 173. MILLERS FALLS CHUCK WITH MORSE TAPER.

Chuck No.	Taper No. 1.	Taper No. 2.	Taper No. 3.	Taper No. 4.
4	**8/–**	**8/8**	—	—
5	**9/5**	**10/2**	—	—
6	**10/10**	**11/8**	**13/10**	—
7	**14/3**	**15/–**	**17/8**	**21/–**

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TAYLORS' CHUCKS.

Fig. 174 (No. 13).

Fig. 174. (No. 24).

"IMPROVED" PATENT SPIRAL TWO-JAW BRASSWORKERS' SELF-CENTRING CHUCKS.

DIMENSIONS AND PRICES.

Size of chuck, inches	$5\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$10\frac{1}{4}$
Weight (with No. 13 jaws), lbs.	$14\frac{1}{2}$	23	40	70
Diameter of centre hole, inches	$1\frac{1}{4}$	$1^{11}/_{16}$	$2\frac{1}{2}$	$2^{13}/_{16}$
Diameter at recess at back of chuck, inches	$3\frac{7}{8}$	$4^{23}/_{32}$	$6\frac{1}{2}$	$4\frac{5}{8}$
Size of No. 13a false jaws (width), inches	$1^{7}/_{16}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$
,, ,, ,, (thickness), inches	$\frac{3}{4}$	1	1	$1\frac{1}{4}$
Price of chuck with No. 13 jaws	**184/–**	**200/–**	**240/–**	**330/–**
,, ,, ,, No. 24 ,, ...	**189/–**	**207/–**	**249/–**	**340/–**
,, Steel false jaw blanks, as No. 13a, per pair	**9/6**	**10/–**	**11/6**	**13/–**
,, ,, ,, ,, No. 11, per pair	**16/–**	**20/–**	**25/–**	**32/–**
,, Extra pair of jaws, as No. 24	**40/–**	**44/–**	**51/–**	**61/–**

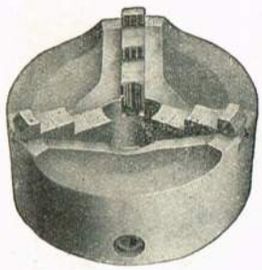

Fig. 175 (No. 1).

Jaws for General Lathe Work.

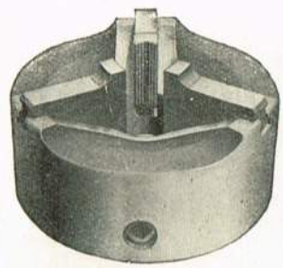

Fig. 175 (No. 2).

Jaws for Bar Work.

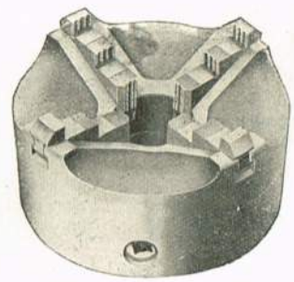

Fig. 176 (No. 21).

Jaws for General Lathe Work.

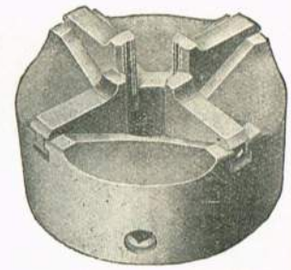

Fig. 176 (No. 22).

Jaws for Bar Work.

Three-Jaw Chucks. No. 175.

Size of chuck, inches	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$10\frac{1}{4}$	$12\frac{1}{4}$	$16\frac{1}{4}$	20
Weight of chuck, with two sets of jaws, lbs.	$9\frac{1}{2}$	$14\frac{1}{2}$	$23\frac{3}{4}$	$41\frac{1}{2}$	$70\frac{3}{4}$	105	$188\frac{1}{2}$	262
Price, with one set of jaws	**140/–**	**152/–**	**168/–**	**200/–**	**276/–**	**330/–**	**608/–**	**960/–**
,, with two sets of jaws	**170/–**	**184/–**	**200/–**	**240/–**	**330/–**	**392/–**	**704/–**	**1116/–**
,, of jaws, as No. 1 or 2 per set	**30/–**	**32/–**	**32/–**	**40/–**	**54/–**	**62/–**	**96/–**	**156/–**
,, of soft jaw blanks, per set	**15/–**	**16/6**	**17/6**	**24/–**	**34/6**	**41/–**	**71/–**	**113/–**
,, of spare pinions, each	**8/–**	**9/–**	**10/–**	**11/–**	**12/–**	**14/–**	**18/–**	**24/–**
,, of keys, each	**6/–**	**7/–**	**8/–**	**10/6**	**13/–**	**15/6**	**18/–**	**25/–**

Four-Jaw Chucks. No. 176.

Size of chuck, inches	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$10\frac{1}{4}$	$12\frac{1}{4}$	$16\frac{1}{4}$	20
Weight of chuck with two sets of jaws, lbs.	$10\frac{1}{2}$	$17\frac{1}{2}$	$27\frac{1}{2}$	46	78	114	203	303
Price, with one set of jaws	**170/–**	**184/–**	**200/–**	**240/–**	**330/–**	**392/–**	**704/–**	**1116/–**
,, with two sets of jaws	**210/–**	**228/–**	**244/–**	**294/–**	**402/–**	**476/–**	**832/–**	**1324/–**
,, of jaws as No. 21 or 22, per set	**40/–**	**44/–**	**44/–**	**54/–**	**72/–**	**84/–**	**128/–**	**208/–**
,, of soft jaw blanks, per set	**20/–**	**21/6**	**24/–**	**31/6**	**46/6**	**55/–**	**95/–**	**150/–**
,, of spare pinions, each	**8/–**	**9/–**	**10/–**	**11/–**	**12/–**	**14/–**	**18/–**	**24/–**
,, of keys, each	**6/–**	**7/–**	**8/–**	**10/6**	**13/–**	**15/6**	**18/–**	**25/–**

An Important Feature.—The above soft jaw blanks have the teeth at the back hardened the same as the standard jaws, ensuring wear and truth. The fronts, being soft, can be machined out to hold the work as required.

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CHUCKS.

All the Chucks shewn are of the latest and most efficient design. The cast iron used in the manufacture (except 180a, which is of steel) is of the finest English close grain. The jaws are manufactured from the finest steel and carefully case-hardened. The screws are of large dimensions and machined accurately. There is a range of Chucks shewn to suit every requirement. Each one is guaranteed to stand up to a reasonable strain. All sizes, 10″ diam. and more have double-thrust and reversible, hardened steel bearings. Bolts for back plates are supplied with each Chuck, also a suitable handle. If necessary, special jaws can be fitted to take special work.

Chucks of 10″ diameter and up have renewable double-thrust hardened steel bearings.

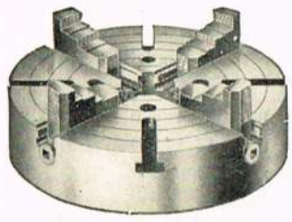

Fig. 180. Independent 4-Jaw Chuck, cast iron body, hardened steel jaws, reversible.
Fig. 180a. Same as above, but with cast steel body.

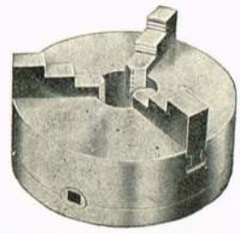

Fig. 181. Independent 3-Jaw (Reversible) Chuck. Hardened steel jaws.

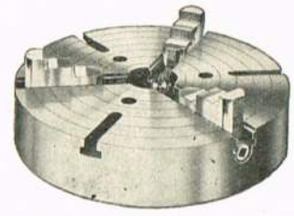

Fig. 182. Universal 3-Jaw Geared Scroll Chucks, with hardened steel jaws.

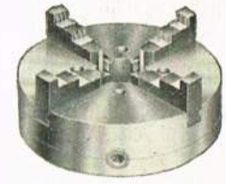

Fig. 183. Universal 4-Jaw Geared Scroll Chucks, with hardened steel jaws.

PRICES AND DIMENSIONS OF 3 AND 4 JAW INDEPENDENT CHUCKS.

Diam. of chuck	Grip of jaws	Diam. of hole in body	Diam. of recess for back plate	Fig. 180 Price 4-jaw chuck with cast iron body	Fig. 181 Price of 3-jaw chuck with cast iron body	Price of back casting	Fig. 180a Price of 4-jaw chuck **with steel** body	Price of back casting screwed and fitted to suit lathe spindle
inches	inches	inches	inches	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
4½	6	1	4⅛	4 3 6	—	0 3 9	—	1 7 0
5	6½	1	4⅛	4 7 6	—	0 3 9	—	1 7 9
6	7½	1 9/16	5	4 12 0	4 4 6	0 4 6	—	1 9 9
8	9½	1¾	4¾	5 8 6	4 18 9	0 5 0	8 15 0	1 14 3
9	10½	1¾	4¾	5 16 8	5 7 3	0 5 6	—	1 16 3
10	12½	2	5⅝	6 5 0	5 15 6	0 6 0	10 8 6	1 18 0
12	14½	2¾	6 11/16	7 6 0	6 14 0	0 8 0	12 2 0	2 8 0
14	16½	3	6 11/16	8 7 0	7 7 6	0 8 0	14 0 0	2 8 0
15	18	3	7 13/16	8 19 3	8 0 0	0 12 0	15 5 0	2 9 6
16	19	3	7 13/16	9 12 0	8 12 6	0 12 0	15 18 6	2 9 6
17	20	4	9½	10 12 0	9 4 6	0 19 0	17 8 6	2 19 6
18	21	4	9½	11 5 0	9 16 0	0 19 0	18 3 6	2 19 6
20	23	4	9½	12 19 0	11 9 0	0 19 0	20 17 6	2 19 6
22	25	5	11	14 12 0	13 2 0	1 8 0	23 15 0	3 6 0
24	27	5	11	16 13 6	14 10 6	1 8 0	27 0 0	3 6 0
26	29	5½	15	19 7 6	—	2 0 0	34 10 0	4 0 0
28	31	5½	15	22 18 6	—	2 0 0	43 0 0	4 0 0
30	34	5½	15	27 2 0	—	2 0 0	47 10 0	4 0 0

PRICES AND PARTICULARS OF GEAR SCROLL 3-JAW CHUCKS (Fig. 182).

Diam. of chuck inches	Grips of jaws inches	Diam. of hole in body inches	Diam. of recess for back plate inches	Price with one set of jaws inside or outside	Price with two sets of jaws inside and outside	Price of back casting	Price of back plate casting fitted and screwed to suit lathe spindle
				£ s. d.	£ s. d.	£ s. d.	£ s. d.
4	4¼	1	3 1/16	3 19 6	4 12 0	0 5 4	1 7 0
5	5	1¼	3 1/16	4 7 6	5 0 0	0 6 2	1 8 0
6	6	1 9/16	4¾	5 0 0	5 17 0	0 6 7	1 10 0
7½	7½	2	4¾	5 12 6	6 13 6	0 6 7	1 10 0
9	9	2½	5⅝	6 17 6	7 18 6	0 10 2	1 16 6
10½	10½	3	5⅝	7 18 6	9 3 6	0 10 2	1 18 0
12	12	3	7	9 7 6	10 17 0	0 13 3	2 8 0
15	15	3¼	7	13 15 0	15 17 0	0 14 0	2 9 6
18	18	4	9½	18 13 6	21 3 6	1 2 3	2 19 6
21	21	4½	9½	23 17 6	27 0 0	1 4 9	3 6 0

PRICES AND PARTICULARS OF GEAR SCROLL 4-JAW CHUCKS (Fig. 183).

Diam. of chuck fnches	Grips of jaws inches	Diam. of hole in body inches	Diam. of recess for back plate inches	Price with one set of jaws inside or outside	Price with two sets of jaws inside and outside	Price of back casting	Price of back plate casting fitted and screwed to suit lathe spindle
				£ s. d.	£ s. d.	£ s. d.	£ s. d.
4	4¼	1	3 1/16	4 7 6	5 12 6	0 5 6	1 7 0
5	5	1¼	3 1/16	4 16 0	5 0 0	0 6 3	1 8 0
6	6	1 9/16	4¾	5 12 6	6 10 0	0 6 9	1 10 0
7½	7½	2	4¾	6 5 0	7 10 0	0 6 9	1 10 0
9	9	2½	5⅝	7 10 0	8 15 0	0 10 3	1 16 6
10½	10½	3	5⅝	8 15 0	10 4 6	0 10 6	1 18 6
12	12	3	7	10 8 0	12 2 0	0 13 3	2 8 0
15	15	3¼	7	14 16 0	17 2 0	0 14 6	2 10 6
18	18	4	9½	20 2 6	23 5 0	1 2 6	3 0 0
21	21	4½	9½	25 19 6	30 2 6	1 5 0	3 6 6

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CHUCKS.

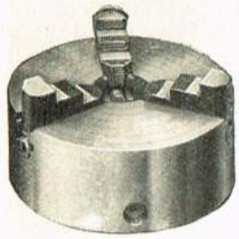
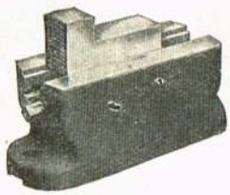


Fig. 184 (illustrated).

Fig. 185, as above, but 4-jaw.

Fig. 184. COMBINED GEAR SCROLL AND INDEPENDENT CHUCKS, 3-Jaw.
Fig. 185. COMBINED GEAR SCROLL AND INDEPENDENT CHUCKS, 4-Jaw.

Size, inches	4	5	6	7½	9
Fig. 184. Price with one set jaws ...	£5 8 6	£6 1 6	£6 17 6	£8 7 0	£10 1 0
Fig. 185. Price with one set jaws ...	£6 9 6	£7 2 0	£8 2 6	£9 16 0	£11 9 6
Price of back castings for either 3 or 4-jaw	5/9	7/–	7/3	7/6	10/9
Price of back casting turned and fitted to suit lathe spindle	£1 7 0	£1 8 0	£1 10 0	£1 10 6	£1 16 6
Size inches ...	10½	12	15	18	21
Fig. 184. Price with one set jaws ...	£11 13 6	£13 7 0	£17 14 6	£22 2 0	£27 19 0
Fig. 185. Price with one set jaws ...	£13 2 6	£15 13 0	£20 0 0	£25 17 6	£31 15 0
Price of back castings for either 3 or 4-jaw	11/–	13/6	14/6	£1 2 9	£1 5 6
Price of back casting turned and fitted to suit lathe spindle	£1 18 6	£2 8 0	£2 9 6	£2 19 9	£3 6 0



IRON AND STEEL FACE PLATE JAWS.

PRICES OF IRON FACE PLATE JAWS, Type Fig. 190.

Size Inches	Price per set of 3 £ s. d.	Price per set of 4. £ s. d.
6	8 2 6	10 16 8
8	10 0 0	13 6 8
10	12 10 0	16 13 4
12	17 10 0	23 6 8
14	22 10 0	30 0 0

PRICES OF IRON FACE PLATE JAWS, Type Fig. 191.

Size Inches	Price per set of 3. £ s. d.	Price per set of 4. £ s. d.
6	8 2 6	10 16 8
8	10 0 0	13 6 8
10	12 10 0	16 13 4
12	17 10 0	23 6 8
14	22 10 0	30 0 0

PRICES OF STEEL FACE PLATE JAWS, Type Fig. 190a.

Size Inches	Price per set of 3. £ s. d.	Price per set of 4. £ s. d.
6	11 5 0	15 0 0
8	14 7 6	19 3 4
10	18 5 0	25 0 0
12	25 0 0	33 6 8
14	34 7 6	45 16 8

PRICES OF STEEL FACE PLATE JAWS, Type Fig. 191a.

Size Inches	Price per set of 3 £ s. d.	Price per set of 4. £ s. d.
6	11 5 0	15 0 0
8	14 7 6	19 3 4
10	18 5 0	25 0 0
12	25 0 0	33 6 8
14	34 7 6	45 16 8

APPROXIMATE DIMENSIONS. Fig. 190 and Fig. 190a.

Nominal size. (Length of body.) Inches	Length over all. Inches	Width of body. Inches	Height of body. Inches	Distance from centre to centre of bolt holes. Inches	Length of sliding jaw. Inches	Width of sliding jaw. Inches	From face of body to top of jaw. Inches	Diam. of bolt. Inches	Weight each jaw, complete. Lbs.
6	8¼	3¼	4	6⅜	4	1½	1⅞	¾	25
8	10¼	3½	4	8⅜	4½	1½	1⅞	¾	33
10	13	4¼	4½	10½	5¼	1¾	2	⅞	54
12	15½	5	4¾	12¾	7	2	2⅛	1	80
14	17½	5½	5	14¾	7	2	2⅛	1	100

APPROXIMATE DIMENSIONS. Fig. 191 and Fig. 191a.

Nominal size Inches	Length over all. Inches.	Height of body. Inches	Width of bolt hole centres. Inches	Length of bolt hole centres. Inches	Length of sliding jaw. Inches	Width of sliding jaw. Inches	From face of body to top of jaw. Inches	Diam. of bolt Inches	Weight each jaw, complete. Lbs.
6	6	3½	6	4	4	1½	1⅞	¾	30
8	8	3½	6	6	4½	1½	1⅞	¾	38
10	10	3¾	6	7	5¾	1¾	2	⅞	56
12	12	3¾	6	9	7	2	2⅛	1	80
14	14	3¾	6	10½	7	2	2⅛	1	105

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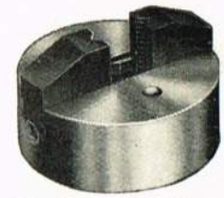
CHUCKS.

Gear Scroll and Independent TWO-JAW Chucks.

Prices and Dimensions the same for Gear-Scroll and Independent.

Fig. 195, 196, 197, 198 all same price.



2-Jaw Chucks. Fig. 195
Universal 2-Jaw Chuck.
Fig. 196
As above, but with independent jaws.

Diam. of chuck inches	Diam. of hole through body of E18 and E20 inches	Diam. of hole through body of E19 and E21 inches	Diam. of recess for back plate inches	Jaws open inches	Prices any pattern	Price of back casting	Price of back casting screwed and fitted for lathe spindle
5	1	1	4⅛	1½	£4 3 4	5/6	27/6
6	1¼	1¼	5	1½	£5 0 0	6/–	29/9
7¼	1½	1½	6 11/16	2½	£6 5 0	8/–	36/3
9	1¾	1¾	6 11/16	3	£7 5 6	8/–	36/6
12	2¼	3	9½	4½	£9 7 0	19/–	48/–
15	2¼	4	9½	7½	£13 0 0	19/6	49/6

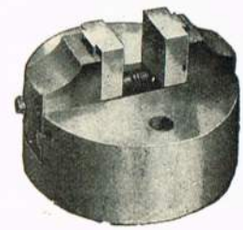


Fig. 197.
Universal 2-Jaw Chuck.

Fig. 198,
As above, but with independent jaws
(flat jaws.)

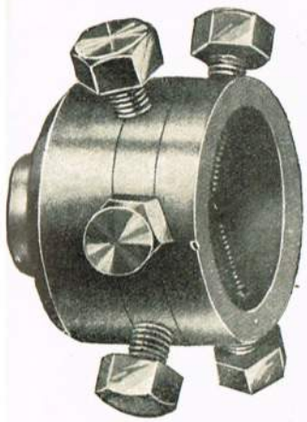


Fig. 199. BELL CHUCKS.

Finished with 4, 6, and 8 screws, are very handy for holding ends of shafts. The bosses are left solid or bored with plain holes as required.

Diameters specified are inside measurements.

DIMENSIONS AND PRICES.

Diameter in inches	1	1½	2	2½	3	3½	4	5	6
Finished, 4 screws	10/9	13/6	16/–	18/9	21/6	24/–	26/9	32/–	42/9
Ditto, 6 screws	14/–	17/6	21/6	24/–	26/9	29/6	32/–	37/6	48/–
Ditto, 8 screws	17/–	20/6	26/9	29/6	32/–	34/9	37/6	42/9	53/6
Approx. weight in lbs.	3	5	10	15	20	23	25	35	48

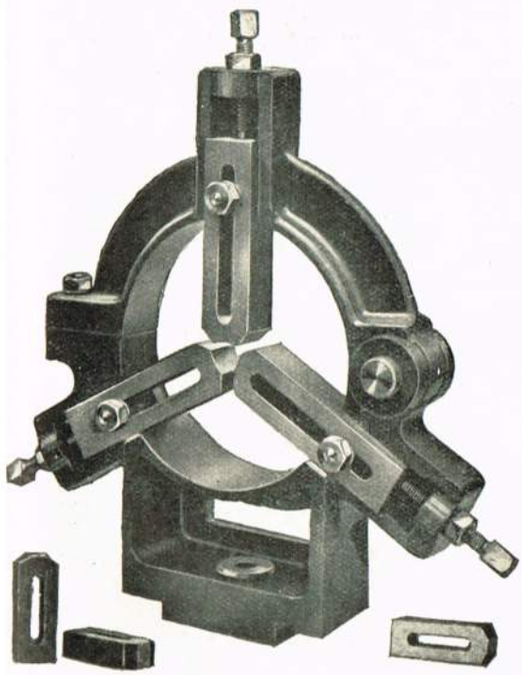


Fig. 200. THREE-JAW LATHE STEADY RESTS

For either English or Continental pattern lathes. Jaws are machined all over. The 9" and over are fitted with 2 sets of jaws.

No.	Height of centres inches	Take shafts up to inches	PRICE Cast iron jaws £ s. d.	PRICE Cast iron jaws with gunmetal tips £ s. d.	PRICE Gunmetal jaws £ s. d.	Approximate weight in lbs.
1	4	4	1 10 6	1 14 6	1 18 6	13
2	4½	4	1 14 6	1 18 6	2 2 6	14
3	5	4	1 19 6	2 3 6	2 7 6	17
4	5½	5	2 12 6	2 17 6	3 4 6	25
5	6	5	2 15 6	3 4 0	3 14 0	27
6	6½	5	3 0 0	3 9 0	3 16 6	28
7	7	6	3 10 0	4 0 0	4 10 0	37
8	7½	6	3 15 0	4 5 0	4 15 0	39
9	8	7	4 0 0	4 10 0	5 10 0	49
10	8½	7	4 10 0	5 0 0	5 15 0	51
11	9	8	5 0 0	5 11 0	7 5 0	60
12	9½	8	5 5 0	5 15 0	7 10 0	63
13	10	8	5 10 0	6 0 0	7 15 0	69
14	10½	8	5 15 0	6 6 0	8 0 0	72
15	11	10	6 0 0	6 12 0	8 10 0	82
16	11½	10	6 5 0	6 17 6	8 15 0	86
17	12	11	6 10 0	7 3 0	9 10 0	100
18	12½	11	7 0 0	7 16 0	10 0 0	105

Fig. 200a. Heavy Pattern.

19	14	14	10 15 0	11 10 0	13 5 0	200
20	16	14	12 10 0	13 5 0	15 0 0	220
21	18	14	14 0 0	14 15 0	16 10 0	230

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LATHE CARRIERS.

Fig. 210.

HEAVY DUTY LATHE CARRIER.

Heavy duty lathe carrier. Drop forged, with 2 safety pattern screws and 1 wrench, machined by special process. The finest lathe carrier on the market. Safety screws are made of selected hardened steel.

Capacity	Price including safety wrench.
3½″	**20/4** each
4″	**34/10** ,,
4½″	**43/4** ,,
5″	**51/10** ,,
6″	**73/–** ,,

Fig. 211.

DROP-FORGED LATHE CARRIERS.

With one safety pattern set screw and one wrench.

Drop forged safety pattern Lathe Carrier. Selected drop forged steel, mottle finish.

Capacity, inches	½	¾	1	1¼	1½
Price each ...	**2/7**	**2/10**	**3/3**	**3/11**	**4/8**
Capacity, inches	1¾	2	2½	3	
Price each ...	**5/6**	**6/5**	**8/3**	**10/7**	

(including safety wrench).

Fig. 212.

Fig. 213.

ORDINARY PATTERN LATHE CARRIERS.

Best malleable iron body, fitted with bright steel screws with hardened point. Bright finished. Neck and tail hardened. Strong and serviceable.

Capacity, ins.	⅜	½	⅝	¾	⅞
Price each ... either patt.	**2/4**	**2/4**	**2/5**	**2/10**	**3/1**
Capacity, ins.	1	1⅛	1¼	1½	1¾
Price each .... either patt.	**3/5**	**3/6**	**3/10**	**4/11**	**5/9**
Capacity, ins.	2	2¼	2½	2¾	3
Price each .... either patt.	**5/9**	**7/6**	**8/3**	**8/9**	**9/9**
Capacity, ins.	3¼	3½	4	5	6
Price each .... either patt.	**11/–**	**12/9**	**15/–**	**21/6**	**27/9**

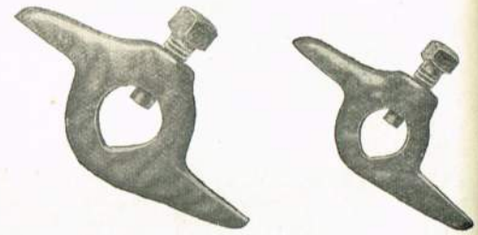

Fig. 214.

PRECISION LATHE CARRIER.

New style carriers are specially recommended for precision lathes. The design ensures the steady and equal drive so essential on light work. Mottled finish.

Size	A	B	C
	1″	¾″	½″
Price ...	**3/3**	**3/–**	**2/9** each

Fig. 215. LIGHT LATHE CARRIERS.

Every precision grinding machine should be equipped with a set of these indispensable accessories.

Size	A	B	C	D	E	F	G
Inches	½	¾	1	1¼	1½	1¾	2
Price each ...	**1/9**	**2/–**	**2/3**	**2/9**	**3/–**	**3/3**	**3/6**

Per set of 7, **17/6**. Black finish.

These carriers have hardened steel screws with square heads.

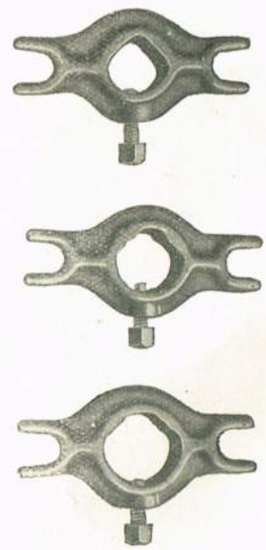

Fig. 216.

CARRIERS FOR GRINDING MACHINES AND LIGHT LATHES.

Size	Price each
¼″ ...	**1/–**
⅜″ ...	**1/3**
½″ ...	**1/3**
⅝″ ...	**1/6**
¾″ ...	**1/6**
⅞″ ...	**1/9**
1″ ...	**2/–**
1⅛″ ...	**2/3**
1¼″ ...	**2/6**

Per set of 9, **14/–** Black finish.

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SOCKETS AND SLEEVES.

Fig. 220. High Grade Steel Sleeves. Standard Morse Taper. Ground externally. Accuracy guaranteed.

Morse Taper Inside ...	0	1	1	1	1	2	2
Morse Taper Outside ...	1	2	3	4	5	3	4
Price each	**3/-**	**2/-**	**3/-**	**3/9**	**6/8**	**3/5**	**3/9**
Morse Taper Inside ...		2	3	3	4	4	5
Morse Taper Outside ...		5	4	5	5	6	6
Price each		**6/8**	**3/9**	**6/8**	**6/8**	**15/-**	**15/-**

Fig. 221. Collets or Sleeves for Milling and Gear Cutting Machines. Brown and Sharps' and Morse Tapers. Hardened and ground to accurate dimensions.

B. & S. Inside Taper	4	5	5	7	5
B. & S. Outside Taper	7	7	9	9	10
Price each	**12/-**	**12/-**	**18/-**	**20/-**	**21/7**
B. & S. Inside Taper	7	9	7	9	10
B. & S. Outside Taper	10	10	11	11	11
Price each	**21/7**	**25/-**	**28/-**	**31/3**	**40/7**
Morse Taper Inside	1	1	2	1	2
B. & S. Outside Taper	7	9	9	10	10
Price each	**15/-**	**20/-**	**20/-**	**25/-**	**25/-**
Morse Taper Inside	3	1	2	3	4
B. & S. Outside Taper	10	11	11	11	11
Price each	**25/-**	**32/-**	**32/-**	**32/-**	**32/-**

Fig. 222. High Grade Steel Sockets. The shank is left rough, but is centred and faced. Price includes plug for use when turning shank.

Morse Taper Inside	Holds Drills.	Whole length.	Diam. of blank end.	Length of blank end.	Net Price each
No. 1	$\frac{1}{4}''$ to $\frac{9}{16}''$	7″	$1\frac{1}{16}''$	4″	**2/6**
No. 2	$\frac{37}{64}''$ to $\frac{29}{32}''$	8″	$1\frac{1}{4}''$	$4\frac{1}{4}''$	**3/9**
No. 3	$\frac{59}{64}''$ to $1\frac{1}{4}''$	10″	$1\frac{1}{2}''$	$5\frac{3}{8}''$	**5/3**
No. 4	$1\frac{7}{64}''$ to 2″	12″	2″	$6\frac{3}{8}''$	**8/4**
No. 5	$2\frac{1}{64}''$ to 3″	16″	$2\frac{5}{8}''$	9″	**28/-**
No. 6	$3\frac{1}{64}''$ to 6″	22″	$3\frac{5}{8}''$	$12\frac{3}{4}''$	**52/6**

Fig. 223. High Grade Steel Sockets, with Morse Taper Shank. Ground externally.

Morse Taper Inside	1	1	1	1	2	2
Morse Taper Outside ...	2	3	4	5	3	4
Price each	**4/2**	**5/3**	**6/8**	**10/-**	**5/3**	**6/8**
Morse Taper Inside	2	3	3	3	3	4
Morse Taper Outside ...	5	2	3	4	5	3
Price each	**10/-**	**6/8**	**6/8**	**6/8**	**10/-**	**10/-**
Morse Taper Inside	4	4	4	5	5	5
Morse Taper Outside ...	4	5	6	4	5	6
Price each	**10/-**	**10/-**	**42/6**	**42/6**	**42/6**	**42/6**

Fig. 224. Agrippa Lathe or Planer Tool Holder.

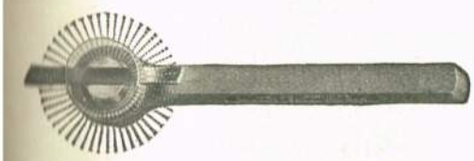
The construction affords most ready release of Cutter for adjustment.

Furnished with one Cutter and Hardened Drop-forged Wrench.

A rugged, substantial tool of absolute efficiency and great dependability on either Lathe or Planer. Because of its numerous angles of adjustment it also makes an excellent Offset Turning Tool.

The construction assures perfect seat and holding qualities for the Cutters; the convex face of Clamp Nut provides uniform locking pressure for Cutters of either square or rectangular form; the serrations in Holder provide for quick, fine and maximum number of Cutter adjustments.

The serrated washer, or Adjustment Ring, which receives fastening and working impact, is hardened and tempered. Should it wear in prolonged service, a new Ring **only** is required—not a complete Holder.



The serrations in Holder indicating maximum of cutter adjustment.

Size.	Holder, Size.	Cutter Size.	Price Extra Adjustment Ring.	Price Cutters only High Speed Steel.	Price Complete Holder with High Speed Cutters.
91	$\frac{1}{2}\times 1\times 7$	$\frac{1}{4}\times\frac{3}{8}$	**1/8**	**1/5½**	**12/11**
92	$\frac{5}{8}\times 1\frac{1}{4}\times 8\frac{1}{2}$	$\frac{5}{16}\times\frac{7}{16}$	**1/10½**	**2/3½**	**16/8**
93	$\frac{3}{4}\times 1\frac{1}{2}\times 10\frac{1}{4}$	$\frac{3}{8}\times\frac{1}{2}$	**2/3½**	**3/4**	**21/10½**
94	$1\times 1\frac{3}{4}\times 13\frac{1}{4}$	$\frac{1}{2}\times\frac{3}{4}$	**2/11**	**8/1½**	**34/4½**
95	$1\frac{3}{8}\times 2\times 16\frac{1}{2}$	$\frac{5}{8}\times\frac{7}{8}$	**4/2**	**13/11½**	**53/1½**
96	$1\frac{3}{4}\times 2\frac{3}{8}\times 19$	$\frac{3}{4}\times 1$	**6/3**	**21/10½**	**81/3**
97	$2\frac{1}{8}\times 2\frac{3}{4}\times 22$	$\frac{7}{8}\times 1\frac{1}{8}$	**9/4½**	**34/2**	**125/-**

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LATHE TOOLS.

Fig. 225. High Grade Hardened Steel Mandrels.

Mandrels are the same length on the ground part as the overall length given by other makers.

Made of special tough steel. The centres are all standardized and made in proportion to the size of the mandrel. The outer edge of the centre is radiused to prevent burring, and recessed below the end so that force may be applied without injury to the centre. See illustration.

Accurately ground on hardened steel centres, ensuring absolute truth.

Tapered .0005 per inch.
Mandrels ¼″ to 1″—.005″ below size at small end.
Mandrels 1 1/16″ to 4″—.001″ below size at small end.

PRICES AND DIMENSIONS.

Diam.	Length of ground part.	Overall length.	Price each.	Diam.	Length of ground part.	Overall length.	Price each.
¼″	3″	4″	**3/4**	1 15/16″	10¾″	13¼″	**25/–**
5/16″	3½″	4½″	**3/9**	2″	11″	14″	**27/–**
⅜″	4″	5″	**4/2**	2 1/16″	11½″	14½″	**29/2**
7/16″	4½″	5½″	**4/7**	2⅛″	11½″	14½″	**31/3**
½″	4¾″	5¾″	**5/–**	2 3/16″	12″	15″	**33/4**
9/16″	5″	6¼″	**5/5**	2¼″	12″	15″	**35/–**
⅝″	5¼″	6½″	**5/10**	2 5/16″	12″	15″	**37/6**
11/16″	5¾″	7″	**6/3**	2⅜″	12½″	15½″	**39/7**
¾″	6″	7¼″	**6/8**	2 7/16″	12½″	15½″	**41/8**
13/16	6¼″	7¾″	**7/1**	2½″	12½″	15½″	**43/9**
⅞″	6½″	8″	**7/9**	2 9/16″	12½″	15½″	**47/–**
15/16″	6¾″	8¼″	**8/4**	2⅝″	13″	16″	**50/–**
1″	7″	8½″	**9/–**	2 11/16″	13″	16″	**53/–**
1 1/16″	7¼″	9¼″	**9/7**	2¾″	13″	16″	**56/3**
1⅛″	7½″	9½″	**10/3**	2 13/16″	13″	16″	**60/6**
1 3/16″	7¾″	9¾″	**10/10**	2⅞″	13½″	16½″	**62/6**
1¼″	8″	10″	**11/8**	2 15/16″	13½	16½	**65/–**
1 5/16″	8¼″	10¾″	**12/6**	3″	14″	18″	**68/9**
1⅜″	8½″	11″	**13/7**	3⅛″	14½″	18½″	**75/–**
1 7/16″	8¾″	11¼″	**14/7**	3¼″	15″	19″	**81/3**
1½″	9″	11½″	**15/8**	3⅜″	15″	19″	**87/6**
1 9/16″	9¼″	11¾″	**16/8**	3½″	15½″	19½″	**96/–**
1⅝″	9½″	12″	**17/9**	3⅝″	16″	20″	**104/–**
1 11/16″	9¾″	12¼″	**18/9**	3¾″	16½″	20½″	**112/6**
1¾″	10″	12½″	**20/–**	3⅞″	17″	21″	**121/–**
1 13/16″	10¼″	12¾″	**21/–**	4″	17½″	21½″	**129/–**
1⅞″	10½″	13″	**23/–**				

N.B — Mandrels of greater length can be supplied at proportionate rates.

Morse Taper Arbors.

Ground to size and tested in Morse gauges, guaranteeing accuracy, made to suit Almond, Horton, Jacobs, etc., chucks.

Fig. 226. Morse Taper Shank.

Taper	¼″	⅜″	½″	¾″	1″
1	**3/–**	**3/–**	**3/–**	**5/9**	**7/6**
2	**3/3**	**3/3**	**3/3**	**5/9**	**7/6**
3	**5/–**	**5/–**	**5/–**	**5/9**	**7/6**
4	**7/6**	—	—	—	—
5	—	—	**10/6**	**10/6**	**10/6**

Fig. 227. Parallel Shank.

Size of Shank	¼″	⅜″	½″	¾″	1″
¼″	**3/3**	**3/3**	**3/6**	**5/9**	**7/6**
⅜″	**3/6**	**3/6**	**4/–**	**5/9**	**7/6**
1″	**4/–**	**4/–**	**4/6**	**5/9**	**7/6**

Fig. 228.
Tap Holders.

M.T. Shank		Size of taps.		
No. 1	....	3/16″ to ½″	Whit or equal	
No. 2	....	⅜″ to ¾″	,,	,,
No. 3	....	⅜″ to 1″	,,	,,
No. 4	....	½″ to 1½″	,,	,,
No. 5	....	¾″ to 2″	,,	,,
No. 6	....	1″ to 2½″	,,	,,
No. 7	....	1¼″ to 3″	,,	,,

Prices on receipt of specifications.

Floating interchangeable sockets can be supplied to fit the above holders for any style of tap.

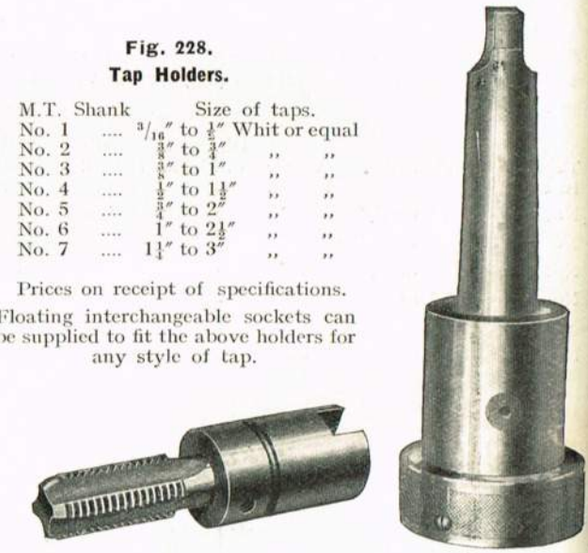

Fig. 229. Plain Rigid Standard Boring Bars.

Finest tempered steel. Ground to accurate dimensions.

An absolutely rigid bar which ensures a true bore to any required depth. Any length supplied to order. Size and position of holes for tools should be stated.

Size No.	Morse Taper Shank	Length	Diam.	Size	Morse Taper Shank	Length	Diam.
E	No. 2	12″	¾″	J	No. 4	36″	1¾″
F	No. 2	18″	1″	K	No. 4	48″	2″
G	No. 3	24″	1¼″	L	No. 5	60″	2¼″
H	No. 3	30″	1½″	N	No. 5	72″	2½″

Prices for your own special requirements quoted by return.

These sockets and bars entirely supersede the soft bars formerly in use, with which it was impossible to manufacture accurately any quantity of parts. The hardening and tempering secures the bar against wear occasioned by contact with the bushings, giving greatly extended life to the tool, and the accuracy of the work produced much more than compensates for the first outlay.

Fig. 230.
High Grade Hardened and Tempered Steel Extension Sockets.

Ground to a high degree of accuracy. Standard Morse Tapers.

Size No.	Morse taper inside	Shank	Length	Price			
B	No. 2	M.T. 2	9″ **17/–**	15″ **22/6**	24″ **30/–**	36″ **44/–**	each
C	No. 3	M.T. 3	9″ **21/–**	15″ **27/–**	24″ **36/–**	36″ **49/–**	,,
D	No. 4	M.T. 4	12″ **28/–**	18″ **37/–**			

Any other taper and any required length to order.

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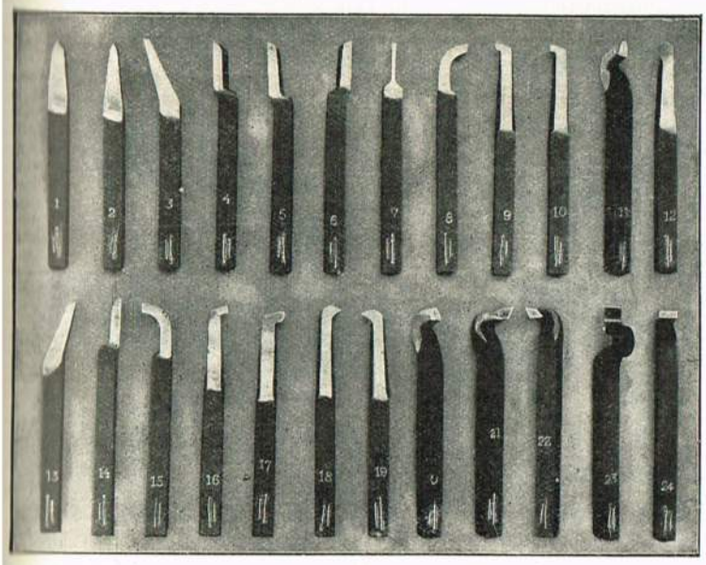
TURNING TOOLS.



T. C. JONES' SLIDE REST TURNING TOOLS.

Fig. 250. Best quality **cast steel** forged, hardened in lead bath.

Fig. 251. Special quality **high speed** tool steel.

Furnished in sets of 12 or 24 tools.

Standard set of tools comprises Nos. 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 15, 19.

ze of Shank, Square, inches ...	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
st Steel, per dozen	**7/6**	**8/–**	**8/9**	**11/9**	**13/6**	**21/–**	**32/6**	**72/3**	**95/–**
gh Speed Steel, per dozen ...	**10/9**	**13/3**	**16/9**	**23/9**	**30/–**	**60/–**	**90/–**	**204/–**	**260/–**

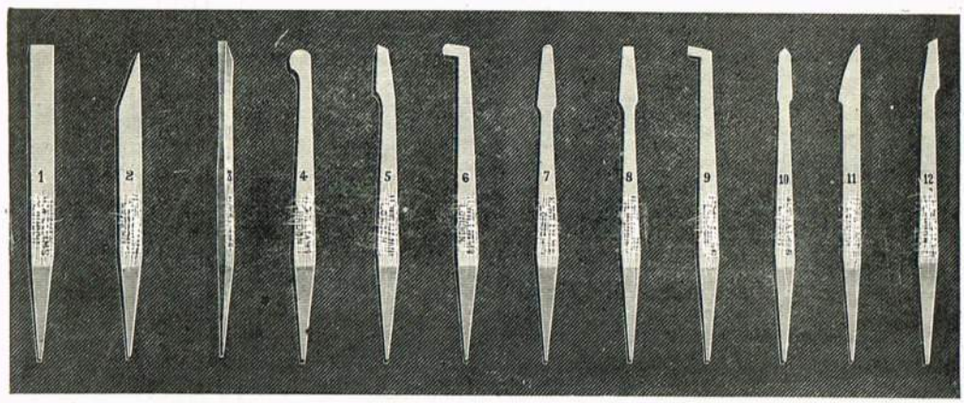


Fig. 252. BEST QUALITY HAND TURNING TOOLS.

For Wood or Metal. Made from Best Quality Crucible Cast Steel, suitably hardened and tempered. Superior finish.

and Turning Tools, per set of 12 ... ... **12/–** per Set.
and Turning Tools, handled and boxed, per set of 12 ... ... **16/3** „

Fig. 253. SOLID-LOCK ALL POSITION TOOL HOLDERS. The tool is made of Drop-forged Steel, well hardened all over. The "axis of strain" is above the cutting edge of the tool, consequently the tool never digs in. The bolt is a secure fit, hardened and ground and fitted with a high nut.

Square shanks	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	inch.
Tool holder, with one high-speed cutter	**8/9**	**11/–**	**15/–**	**22/6**	**37/6**	each.
Extra for boring-tool bolt complete with collar and nut	**3/9**	**5/–**	**6/6**	**8/6**	**13/–**	each.
Chasers, Internal and External, in carbon steel	**24/–**	**27/–**	**30/–**	**36/–**	**48/–**	dozen.
	60—12	60—10	60—8	60—6	60—$3\frac{1}{2}$	T.P.I.
High-speed Cutters, outside	**10/–**	**12/6**	**15/–**	**21/–**	**30/–**	dozen.
Boring Cutters	**12/–**	**15/–**	**18/–**	**25/–**	**35/–**	dozen.

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LATHE TOOLS.

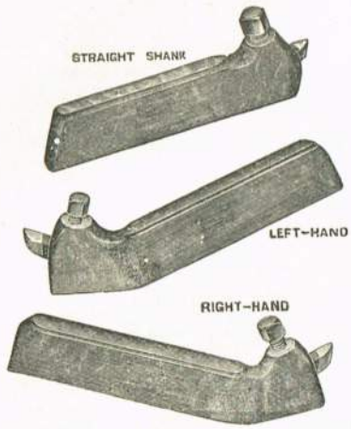


Fig. 254.

Drop forged steel, case hardened & machined, **Turning Tool Holder** for American Lathes, complete with wrench and high-speed cutter.

Size No.	Size of cutter	Size of holder, all patterns Straight.	Size of holder, all patterns Left.	Size of holder, all patterns Right.	Price each any pattern	Price each H.S. cutter
1	3/16	5/16 × 3/4 × 4½			7/6	–/9
2	¼	⅜ × ⅞ × 5			8/–	1/1
3	5/16	½ × 1⅛ × 6			9/–	1/6
4	⅜	⅝ × 1⅜ × 7			11/3	2/3
5	7/16	¾ × 1⅝ × 8			15/–	3/4
6	½	⅞ × 1¾ × 9			19/3	4/9
7	⅝	1 × 2 × 11			24/6	7/3
8	¾	1¼ × 2½ × 13			36/6	11/10
9	⅞	1½ × 2½ × 16			62/6	16/8
10	1	1⅝ × 2¾ × 18			91/9	24/7

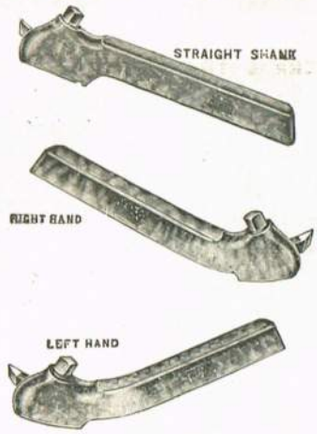


Fig. 255.

Drop forged steel, case hardened & machined, **Turning Tool Holder** for English lathes, complete with high-speed cutter and wrench.

Size No.	Size of cutter	Hght. base to point	Size of holder all patterns Straight.	Size of holder all patterns Right.	Size of holder all patterns Left.	Price ea. any pattern	Price ea. H.S. cutter.
11	3/16	9/16	½ × ⅝ × 6			8/–	–/9
12	¼	11/16	⅝ × ¾ × 7½			9/6	1/1
13	5/16	13/16	¾ × ⅞ × 8½			12/–	1/7
14	⅜	15/16	⅞ × 1 × 9½			15/3	2/3
15	7/16	1 1/16	1 × 1⅛ × 10½			19/3	3/4
16	½	1 3/16	1⅛ × 1¼ × 11½			24/3	4/9
17	⅝	1 5/16	1⅜ × 1½ × 13½			35/9	7/3
18	¾	1½	1⅝ × 1¾ × 15½			57/6	11/10
19	⅞	1¾	1⅞ × 2 × 17½			85/6	16/8
20	1	2	2⅛ × 2¼ × 19½			114/6	24/7

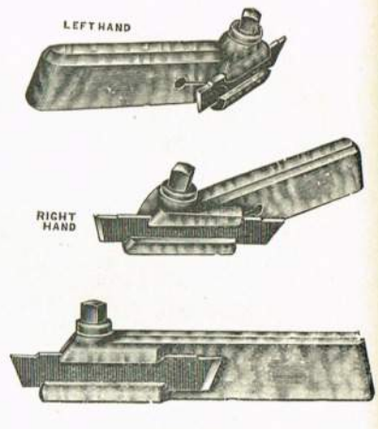
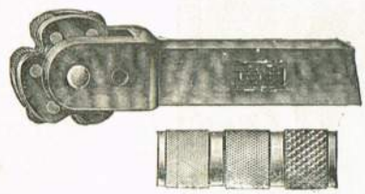


Fig. 256.

Drop forged steel, case hardened, **Improved Cutting-off Tool Holder** complete with high-speed blade and wrench. The blades are sent out ready for use, one end ground for cutting off, the other for screw cutting.

Size No.	Size of cutter Left.	Size of holder Right.	Price each complete any pattern Straight.	Price H.S. each cutter Straight.
31	½ × 3/16	5/16 × ¾	8/–	1/6
32	⅝ × ⅛	⅜ × ⅞	8/–	2/3
33	¾ × ⅛	½ × 1⅛	9/–	3/–
34	⅞ × 3/16	⅝ × 1⅜	11/6	4/6
35	1 × 3/16	¾ × 1⅝	15/–	6/6
36	1⅛ × ¼	⅞ × 1¾	18/9	8/6
37	1¼ × ¼	1 × 2	24/–	10/6



Specimens of knurling.

Fig. 267. Knurling Tool comprising fine, medium and coarse. Knurls are milled from crucible steel.

Size No.	Size	Knurls	Price complete	Price Knurls per pair
50	1⅛″ × 6½″	¼″ wide	25/– ea.	3/– ea.

All parts interchangeable.

Fig. 258. Thread-Cutting Tool Holder. Can be used on English or American type of tool posts. Is adjustable. Cutting blade exact to Whitworth shape and finishes the threads with Standard radius at both root and crest. Cutters have 15° clearance from the perpendicular.

Size No.	Size	Weight	Price with cutter each	Price of cutters each
51	¾ × ⅜ × 5¼	10½oz.	11/6	4/3
52	1 × ⅜ × 6	19 ozs.	11/6	4/3
53	1½ × ⅝ × 8½	2lb. 14ozs.	20/9	4/3

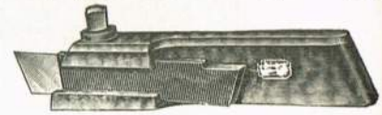


Fig 259. Side or Knife Tool Holder of different section to Fig. 256 series. Will allow facing up to shoulder. Complete with wrench and high-speed cutter.

Size No.	Holder size. Straight, Left or Right Hand	Size of Cutter	Price	Spare H.S. Blades.
41	5/16 × ¾	½ × ⅛	8/10	1/6
42	⅜ × ⅞	⅝ × 5/32	10/5	2/1
43	½ × 1⅛	¾ × 3/16	12/3	3/1
44	⅝ × 1⅜	⅞ × 3/16	14/–	4/4
45	¾ × 1⅝	1 × ¼	19/7	6/3
46	⅞ × 1¾	1⅛ × ¼	24/–	8/9
47	1 × 2	1¼ × 5/16	35/3	12/6

Fig. 260.

PIVOTED HEAD KNURLING TOOL.

Self-adjusting to the work Size 4½″ × ⅜″ × ⅜″. Knurls ⅜″ wide.

Price **12/6.**

Extra Knurls **3/-** per pair

Fig. 261. SINGLE HEAD KNURLING TOOL.

Size 4″ × ⅜″ × ⅜″, Knurls ⅜″ wide. Price **5/-.** Extra Knurls, **1/6** each. Straight cut or small, medium or large size diamond knurls supplied. Special design knurls to order.

ONE-PIECE BORING BARS

Fig. 262. With English Pattern Holders.

Size No.	Size of bar	Size of cutter	Size of block	Height from rest to point	Price with 2 cutters & English holder	Price bar only
92	⅜ × 4½	⅛	½ × 1½	5/16	10/–	7/6
93	7/16 × 5¼	3/16	⅝ × 1¾	13/32	12/–	8/6
94	9/16 × 6¾	¼	¾ × 2¼	½	14/–	10/6
95	¾ × 9	5/16	1 × 3	21/32	18/–	15/–
96	15/16 × 11½	⅜	1⅛ × 3¾	¾	26/–	21/–
97	1⅛ × 13½	7/16	1½ × 4½	31/32	36/–	29/–
98	1 5/16 × 15¾	½	1¾ × 5¼	1⅛	48/–	36/–
99	1½ × 18	⅝	2 × 6	1 5/16	62/–	46/–
100	1⅞ × 22½	¾	2¼ × 7½	1½	84/–	62/–

Fig. 263. With American Pattern Holder.

Size No.	Size of bar	Size of cutter	Size of block	Height from rest to point	Price with 2 cutters	Price bar only
102	⅜ × 4½	⅛	¼ × ½ × 3	½	12/–	7/6
103	7/16 × 5¼	3/16	5/16 × ⅝ × 3⅜	21/32	14/–	8/6
104	9/16 × 6¾	¼	⅜ × ¾ × 4¼	13/16	17/–	10/6
105	¾ × 9	5/16	½ × 1 × 5	1¼	24/–	15/–
106	15/16 × 11¼	⅜	⅝ × 1¼ × 6	1½	32/–	21/–
107	1⅛ × 13½	7/16	¾ × 1½ × 7½	1 7/16	45/–	29/–
108	1 5/16 × 15¾	½	⅞ × 1⅝ × 9	1⅝	62/–	36/–
109	1½ × 18	⅝	1 × 1¾ × 10½	1¾	80/–	46/–
110	1⅞ × 22½	¾	1⅛ × 2 × 13	2⅜	120/–	62/–

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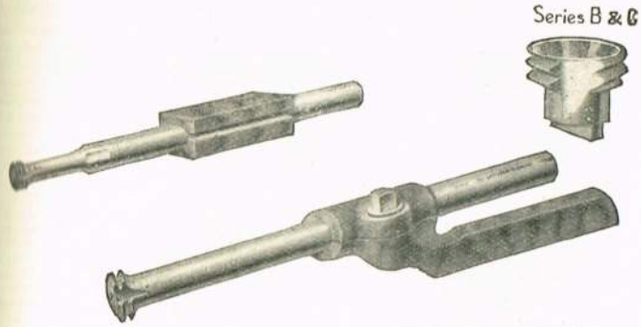
LATHE TOOLS.

INTERNAL THREAD CUTTING TOOLS.

Illustrates Series A with English holder.



Series B and C with American holder.

Precision formed tools, producing threads of unequalled perfection, completely outclassing all former methods of cutting internal threads and eliminating all forging, hardening and grinding.

Cutters for all standard threads :—Whitworth, British Association, Metric, or U.S.S. supplied to order.

When ordering please specify smallest hole to be threaded, number of threads per inch, and form. All cutters supplied for right hand threads unless otherwise ordered.

Special for precision lathes of any well-known make.

Fig. 267a.
ROUGHING CUTTER.
Price **7/6.**

Fig. 267b.
COMPLETE ROUGHING CUTTER.
shown in English holder.
Price **17/6** each.

Fig. 267c. In American holder, **19/6** each.

Fig. 264a.

For $\frac{1}{2}''$ diameter holes and up. Cutting all threads up to 10 pitch Whitworth.

	Price each
Bar and 1 cutter	**20/–**
Holders, English pattern	**2/6**
,, American ,, ...	**4/6**
Extra cutters	**12/6**

Fig. 265b.

For holes 1″ diameter and up. Cutting all threads up to 4 pitch Whitworth.

	Price each
Bar, $^{9}/_{16}'' \times 5''$, and 1 cutter ...	**25/–**
Holders, English pattern ...	**3/6**
,, American ,, ...	**6/6**
Extra cutters, $\frac{3}{4}''$ diameter ...	**15/–**
,, ,, $1^{1}/_{16}''$ diameter ...	**17/–**

Fig. 266c.

For holes $1\frac{3}{4}''$ diameter and up. Cutting any pitch of thread.

	Price each
Bar, $\frac{3}{4}'' \times 6''$, and 1 cutter ...	**32/–**
Holders, English pattern ...	**4/6**
,, American ,, ...	**9/–**
Extra cutters, $1\frac{1}{2}''$ diameter ...	**18/–**

COMPLETE OUTFITS FOR PRECISION LATHES.

Specially suitable for Drummond, $3\frac{1}{2}''$ and 4″ Patrick, Metric, Super, Relm, Bantam, etc.

Fig. 268. Set.

Comprises the following for lathes with $3\frac{1}{2}''$ to 4″ centres : Straight turning tool, right hand side tool, cutting-off tool with extra blade for screw-cutting, knurling tool, one-piece boring bar, internal thread-cutting tool for holes $\frac{1}{2}''$ diameter and up, and one of each C and D centre drills. Very suitable for model maker.

Price, in box complete ... **£3 10 0.**

Fig. 269. Set.

Comprises one-piece boring bar with straight and 45° cutters, straight turning tool, left and right hand turning tools, cutting-off tool with extra blade for screw-cutting, right and left hand side tools, one each $\frac{3}{8}''$, $\frac{1}{2}''$, $\frac{5}{8}''$ and $\frac{3}{4}''$ mandrels, one each $\frac{1}{2}''$, $\frac{3}{4}''$ and 1″ lathe carriers, an assortment of high-speed steel cutters, knurling tool and internal threading tool for holes $\frac{1}{2}''$ diameter and up.

Price, in box complete ... **£7 0 0.**

Fig. 280. MORSE TAPER LATHE CENTRES.

Manufactured from the finest carbon steel. Tempered and ground to size. Guaranteed accurate to .0005″. High speeds without burning or freezing.

Morse taper No.	1	2	3	4	5	either style
Price	**3/6**	**4/6**	**7/–**	**10/6**	**21/–**	each

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LATHE TOOLS.

Sleeve Bar.

Plain Bar.

Furnished with either sleeve or plain bar, 1 each 45° and 90° cutter and hardened wrenches.

Fig. 290. "Agrippa" Boring Tool Holders.

With this holder encumbering sleeves or bushings are unnecessary for interchangeable bars. Commercial forms of bar steel are adaptable for either bars or cutters without machining.

The sleeve-bar fastening provides for the rapid adjustment of either straight or angular cutters without the use of extra parts; it has greater strength than others of the same general design. The plain bar provides for use with either straight or angular cutters in the simplest manner possible, and is furnished with headless set screws.

Unless otherwise specified standard size sleeve-bar will be furnished

Size	Holder size	Holder capacity for bars size	Standard bar, size	Price—Complete Holder With plain bar High speed cutters	Price—Complete Holder With sleeve bar High speed cutters
080	$^5/_{16}\times\frac{3}{4}$	$^3/_{16}$ to $\frac{1}{2}$	$\frac{1}{2}$	**12/1**	**13/6½**
80	$\frac{3}{8}\times\frac{7}{8}$	$\frac{1}{4}$ to $\frac{5}{8}$	$\frac{5}{8}$	**12/8½**	**14/4½**
81	$\frac{1}{2}\times1\frac{1}{8}$	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{3}{4}$	**15/2½**	**17/1**
82	$\frac{5}{8}\times1\frac{3}{8}$	$\frac{3}{8}$ to $^{15}/_{16}$	$^{15}/_{16}$	**19/7**	**22/6**
83	$\frac{3}{4}\times1\frac{5}{8}$	$\frac{1}{2}$ to $1\frac{1}{8}$	$1\frac{1}{8}$	**28/1½**	**31/8**

Sleeve Bar.

Plain Bar.

PRICES AND PARTICULARS OF BARS.

Furnished with two cutters and hardened wrench.

The sleeve-bar fastening provides for the rapid adjustment of either straight or angular cutters without the use of extra parts; it has greater strength than others of the same general design. The plain bar provides for use with either straight or angular cutters in the simplest manner possible, and is furnished with headless set screws.

"Agrippa" Boring Bars. Approximate size Plain	Sleeve	For use with holder and post number	Cutters Size	For use at angles of	Price Cutter only. high speed steel	Complete bar Plain with high speed cutters	Sleeve with high speed cutters
$\frac{1}{2}\times8\frac{1}{8}$	$\frac{1}{2}\times7\frac{5}{8}$	080–83	$^3/_{16}\times1$	90°	–/5	5/5	6/10½
			$^3/_{16}\times1\frac{1}{2}$	45°	–/6		
$\frac{5}{8}\times10\frac{1}{8}$	$\frac{5}{8}\times9\frac{1}{8}$	80–83.	$^3/_{16}\times1$	90°	–/5	5/10	7/6
			$^3/_{16}\times1\frac{1}{2}$	45°	–/6		
$\frac{3}{4}\times12\frac{1}{8}$	$\frac{3}{4}\times11$	81–83	$\frac{1}{4}\times1\frac{1}{4}$	90°	–/7½	7/6	9/4½
			$\frac{1}{4}\times2$	45°	–/9½		
$^{15}/_{16}\times14\frac{1}{8}$	$^{15}/_{16}\times13\frac{1}{4}$	82–83	$^5/_{16}\times1\frac{1}{2}$	90°	1/–		
			$^5/_{16}\times2\frac{1}{2}$	45°	1/4	10/10	13/9
$1\frac{1}{8}\times16\frac{3}{4}$	$1\frac{1}{8}\times16$	83	$\frac{3}{8}\times1\frac{7}{8}$	90°	1/5½		
			$\frac{3}{8}\times3$	45°	2/3½	15/7½	19/2
$1^5/_{16}\times20$	$1^5/_{16}\times19$	2–5	$\frac{3}{8}\times2\frac{1}{8}$	90°	1/8	23/11½	26/0½
			$\frac{3}{8}\times3\frac{1}{4}$	45°	2/6		
$1\frac{1}{2}\times23\frac{1}{2}$	$1\frac{1}{2}\times23\frac{1}{4}$	3–5	$^7/_{16}\times2\frac{1}{4}$	90°	2/6	33/4	35/5
			$^7/_{16}\times3\frac{3}{8}$	45°	3/6½		
$1^{13}/_{16}\times28$	$1^{13}/_{16}\times27\frac{1}{4}$	4–5	$\frac{1}{2}\times2\frac{5}{8}$	90°	3/9	44/9½	48/11½
			$\frac{1}{2}\times4$	45°	5/5		
$2\frac{1}{4}\times34$	$2\frac{1}{4}\times33$	5	$\frac{5}{8}\times3\frac{1}{8}$	90°	7/1	60/5	67/8½
			$\frac{5}{8}\times4\frac{3}{4}$	45°	9/9½		

Fig. 291. "Agrippa" Adjustable Boring Too lPost for Multiple Bars.

Furnished with either sleeve or plain bar, 1 each 45° and 90° cutter and hardened wrenches.

SPECIFICATION AND PRICES.

Each post accommodates a wide range of bars; commercial sizes of bar steel are adaptable for either bars of cutters without machining.

The height of the bar is easily and quickly adjusted—a turn of the knurled ring will raise or lower the base on which the bar rests; tightening the set screw in the head of the post then locks the whole device instantly, giving an extremely rigid tool.

Unless otherwise specified standard size sleeve-bar will be furnished.

Size...	2	3	4	5
Post—Length over all, without screw	$6\frac{5}{8}$	$7\frac{5}{8}$	$9\frac{1}{8}$	$11\frac{1}{8}$
*"T" slot flange—Diameter. ...	3	$3\frac{1}{2}$	$4\frac{1}{4}$	5
Thickness ...	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$1^1/_{16}$
*"T" slot neck—Diameter... ...	$1\frac{5}{8}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
Length	$\frac{3}{4}$	$^{13}/_{16}$	1	$1\frac{1}{4}$
Post capacity for bars—size... ...	$\frac{1}{2}$ to $1^5/_{16}$	$\frac{1}{2}$ to $1\frac{1}{2}$	$\frac{5}{8}$ to $1^{13}/_{16}$	$\frac{3}{4}$ to $2\frac{1}{4}$
Standard bar—size	$1^5/_{16}$	$1\frac{1}{2}$	$1^{13}/_{16}$	$2\frac{1}{4}$
Price—Complete post:				
With plain bar—high speed cutters	**66/8**	**88/6½**	**116/8**	**164/7**
With sleeve bar—high speed cutters	**68/9**	**90/7½**	**120/10**	**171/10½**

* The "T" slot flange and neck are furnished large to allow for fitting to individual machines.

Fig. 292. Machine-Cut Knurling Wheels.

All ¾" outside diameter. Hole ¼" diameter. Thick $^5/_{16}$".

Made on gear hobbing machines, ensuring great accuracy, from best tool steel, thus ensuring long life.

21/– per dozen.

Different Types.

L.H. Spiral Course	Straight Course
R.H. Spiral Course	Straight Medium
L.H. Spiral Medium	Straight Fine
R.H. Spiral Medium	Diamond Course
L.H. Spiral Fine	Diamond Medium
R.H. Spiral Fine	Diamond Fine

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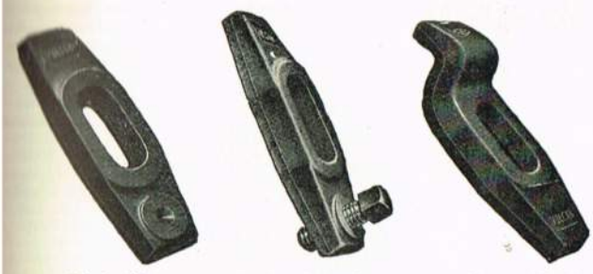
CLAMPS, Etc.

Fig. 293 "VULCAN" DROP-FORGED STRAP CLAMPS.



Plain Slot. Adjustable Step. Goose Neck.

These forgings are made from a strong, tough grade of carefully selected steel, and are subjected to a special refining process of heat-treatment, after forging, which greatly increases their strength and stiffness. On planer, lathe, drill press, milling and boring machine work they are time-saving and effective.

Because of draft or taper on forgings, minimum dimensions of opening are given in table.

Plain Slot Pattern.

Size	Length	Width Ends	Width Centre	Thickness Ends	Thickness Centre	Slot, Minimum dimensions Length	Slot, Minimum dimensions Width	Price
54	4	1 3/16	1 5/8	1/2	3/4	1 3/8	11/16	**1/3**
56	6	1 1/4	1 3/4	9/16	7/8	2 1/16	11/16	**2/1**
58	8	1 1/2	2 1/8	3/4	1 1/8	2 13/16	13/16	**3/6½**
59	10	1 3/4	2 1/2	15/16	1 3/8	3 11/16	15/16	**5/10**

Adjustable Step Pattern.

Size	Length	Width Ends	Width Centre	Thickness Ends	Thickness Centre	Slot, minimum dimensions	Dia.	Screws Length under head	Price Extra screws each	Price Complete Clamps each
54A	4	1 3/16	1 5/8	1/2	3/4	11/16 × 1 3/8	1/2	1 1/4	–/7	**2/3½**
56A	6	1 1/4	1 3/4	9/16	7/8	11/16 × 2 1/16	5/8	1 1/2	–/9	**3/6½**
58A	8	1 1/2	2 1/8	3/4	1 1/8	13/16 × 2 13/16	3/4	1 3/4	**1/0½**	**5/5**
59A	10	1 3/4	2 1/2	15/16	1 3/8	15/16 × 3 11/16	7/8	2 1/8	**1/5½**	**8/4**

Goose Neck Pattern.

Size	Length	Width Ends	Width Centre	Thickness Ends	Thickness Centre	Slot, minimum dimensions Length	Slot, minimum dimensions Width	Neck offset	Price
74	4	1 3/16	1 5/8	3/8 & 1/2	3/4	15/16	11/16	13/16	**1/3**
76	6	1 1/4	1 3/4	7/16 & 9/16	7/8	1 11/16	11/16	15/16	**2/1**
78	8	1 1/2	2 1/8	9/16 & 3/4	1 1/8	2 7/16	13/16	1 1/8	**3/6½**

Fig. 294. Best Quality Hardened Steel Drifts.

Made from tempered drawn spring steel. Sand blast selected finish.

Sizes: 1, **1/3** each. 2, **1/6** each. 3, **1/8** each. 4, **2/1** each.

Fig. 295. Emery Wheel Dresser.

Unequalled for trueing your grinding wheels.

Has a removable bushing which is easily replaced when worn out, making the dresser equal to new. A Paragon Cutter for trueing to a smooth surface is supplied as well as a Foundry Cutter for use where a rough surface is required.

Price complete with two sets of cutters, **5/–**.

Extra bushes, right or left threads, **4d.** each.

Specially tempered and hardened spindles, **2/–** per doz.

Paragon Cutters. **7/–** per doz. nett.

Foundry Cutters. **12/–** per doz. nett.

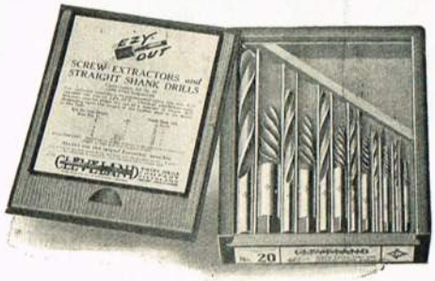


Fig. 296.

THE "EZY-OUT" BROKEN SCREW EXTRACTOR.

A unique tool specially designed for extracting broken screws in work. To work, drill a hole to correspond with the size of broken bolt and extractor. Insert the "Ezy-out" extractor and twist. The screw will easily come out on its own thread. These are made in various sets, from light to heavy use.

Particulars and Prices of "Ezy-out" Broken Screw Extractors.

Set No. 20. "The Handy Set."

Tool No.	Point diam. inches	Large diam. inches	Length inches
1	1/16	1/8	2 1/32
2	3/32	3/16	2 13/32
3	1/8	1/4	2 23/32
4	3/16	11/32	3 1/16
5	1/4	7/16	3 15/32
6	3/8	19/32	3 3/4

Price complete with box, **21/–**.

Set No. 17. "General Utility Set."

Tool No.	Point diam. inches	Large diam. inches	Length inches
4	3/16	11/32	3 1/16
5	1/4	7/16	3 15/32
6	3/8	19/32	3 3/4

Price complete with box, **10/–**.

Set No. 15. "Tool Room Set."

Tool No.	Point diam. inches	Large diam. inches	Length inches
1	1/16	1/8	2 1/32
2	3/32	3/16	2 13/32
3	1/8	1/4	2 23/32
4	3/16	11/32	3 1/16
5	1/4	7/16	3 15/32

Price complete with box, **12/6**.

Set No. 16. "Heavy Shop Set."

Tool No.	Point diam. inches	Large diam. inches	Length inches
6	3/8	19/32	3 3/4
7	1/2	3/4	4 1/8
8	3/4	1 1/64	4 3/8
9	1	1 9/32	4 5/8

Price complete with box, **28/–**

Set No. 15A. "Garage Special."

Tool No.	Point diam. inches	Large diam. inches	Length inches
1	1/16	1/8	2 1/32
2	3/32	3/16	2 13/32
3	1/8	1/4	2 23/32
4	3/16	11/32	3 1/16
5	1/4	7/16	3 15/32
6	3/8	19/32	3 3/4

Price complete with box, **16/9**.

"EZY-OUT" EXTRACTORS FOR EXTRA HEAVY WORK.

Sold individually.

Tool No.	Point diam. inches	Large diam. inches	Length inches	Price each
10	1 1/4	1 9/16	5	**16/9**
11	1 1/2	1 7/8	5 5/8	**22/6**
12	1 7/8	2 5/16	6 1/4	**28/–**

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TOOLS FOR CAPSTAN LATHES.

PRICES ON APPLICATION.

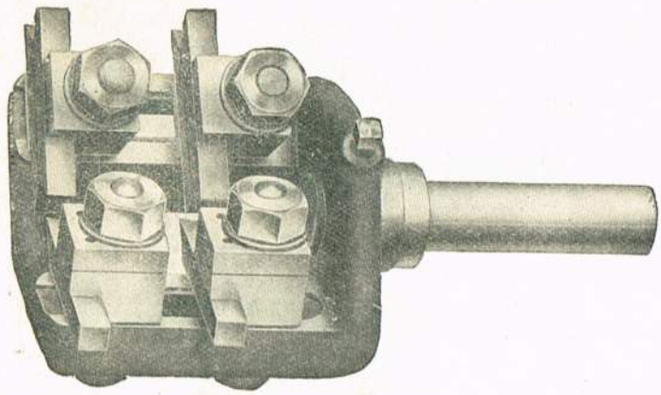

Fig. 300. DOUBLE BOX TOOL.

For turning two different diameters at the same time. Each tool is fitted with adjustable steadies.

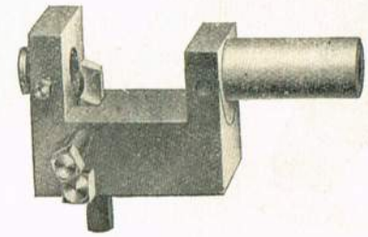

Fig. 300A.
COMBINED BOX AND CENTREING TOOL HOLDER.

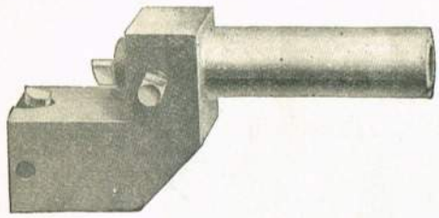

Fig. 300B.
KNEE TOOL.

For use in turret.

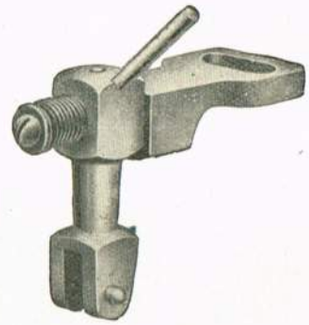

Fig. 300C.
KNURLING TOOL HOLDER.

For use on cutting off rest.

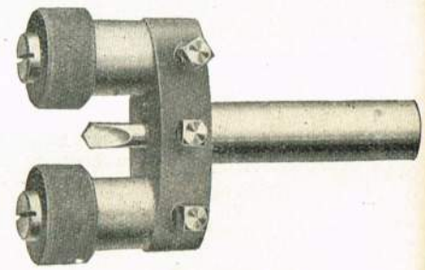

Fig. 300D.
COMBINED CENTREING AND KNURLING TOOL.

For use in turret. Knurles are mounted on eccentric spindles to allow for adjustment.

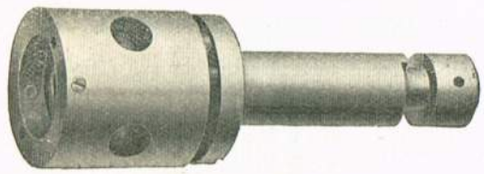

Fig. 300E.
QUICK-RELEASE DIE HOLDER.

Made in large and small sizes. Shanks are hardened and ground.

Fig. 300F.
QUICK-RELEASE TAP HOLDER.

Made in large and small sizes. Hardened and ground shanks.

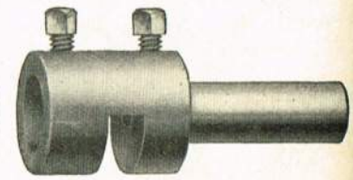

Fig. 300G.
HOLLOW MILL HOLDER.

Specially adapted for inside forming tools.

Fig. 300H.
DRILL CHUCK.

For use in turret. Fitted with collet to take drills up to ¼″ diameter.

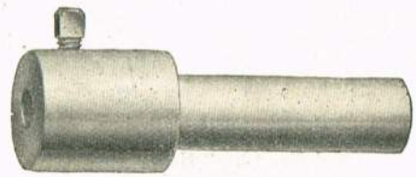

Fig. 300I.
QUICK-RELEASE TAP HOLDER.

Made in large and small sizes. Shanks are hardened and ground.

Fig. 300J.
ADJUSTABLE STOP.

For use in the turret to regulate the length of the bar feed through the wire feed. Screw hardened and shank ground.

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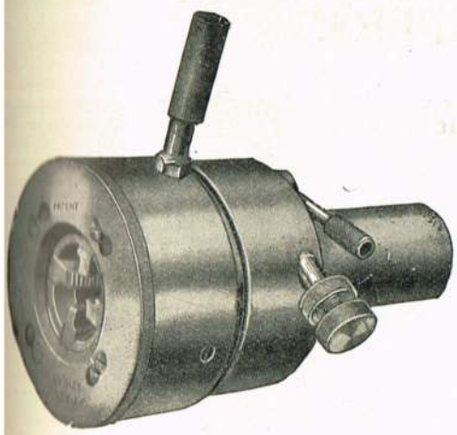

Fig. 301. "COVENTRY" PATENT SELF-OPENING

DIEHEADS AND DIES.

STYLE C.

(Excepting $\frac{5}{16}''$ size which is now Style C1.)

Size of Diehead	$\frac{5}{16}''$			$\frac{1}{2}''$			$\frac{3}{4}''$			1″			$1\frac{1}{4}''$			$1\frac{1}{2}''$			2″			3″			$4\frac{1}{2}''$		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Price, minus Dies	9	10	0	10	5	0	12	10	0	15	0	0	17	0	0	21	0	0	26	0	0	50	0	0	85	0	0
Standard Dies—(Class I), per Set ...	0	14	0	0	16	0	0	18	6	1	0	0	1	5	0	1	10	0	2	2	6	3	10	0	7	6	0
Special Dies —(Class II), six sets or over, per Set	0	18	8	1	1	4	1	4	8	1	6	8	1	13	4	2	0	0	2	16	8	4	13	4	7	6	0
Special Dies—(Class II), under six sets, per Set	1	8	0	1	12	0	1	17	0	2	0	0	2	10	0	3	0	0	4	5	0	7	0	0	7	6	0
Extra for fitting special shank smaller than standard size	2	3	0	2	9	0	2	13	0	3	0	0	3	7	0	3	10	0	4	6	0	5	6	0	—		
Tapering arrangement with one former..		—		15	0	0	16	5	0	17	5	0	18	0	0	19	10	0	21	0	0	26	10	0	32	0	0
Extra formers, each		—		1	2	0	1	2	0	1	2	0	1	2	0	1	4	0	1	5	0	1	5	0	1	15	0
Rotating Attachment, extra		—		5	17	0	7	3	0	8	17	0	10	15	0	14	0	0	16	0	0	21	5	0	32	0	0
Die Grinding Fixtures, including Base-plates	1	16	0	1	15	0	2	0	0	2	2	0	2	5	0	2	10	0	2	15	0	3	5	0	5	0	0
Height Gauges	2	12	0	2	19	0	3	4	0	3	9	0	4	0	0	4	5	0	4	11	0	5	3	0	3	2	6
Grinding Face and Taper of Dies, per Set	0	2	6	0	2	6	0	3	3	0	3	3	0	3	3	0	3	6	0	4	0	0	5	6	0	7	0

"COVENTRY" PATENT SELF-OPENING FINE THREAD DIEHEADS AND DIES.

Size of Diehead	$2\frac{1}{2}''$			$3\frac{1}{2}''$			5″			$6\frac{1}{2}''$		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Price, minus Dies	25	0	0	32	0	0	50	0	0	70	0	0
Standard Dies—(Class I), per Set	1	0	0	2	0	0	2	10	0	3	10	0
Special Dies—(Class II), six sets or over, per Set ...	1	6	8	2	13	4	3	6	8	4	13	4
Special Dies—(Class II), under six sets, per Set...	2	0	0	4	0	0	5	0	0	7	0	0
Tapering arrangement with one former	20	0	0	21	0	0	26	0	0	30	0	0
Extra formers, each ...	1	5	0	1	5	0	1	6	0	1	10	0
Rotating Attachment, extra.	17	0	0	20	0	0	24	0	0	30	0	0
Die Grinding Fixtures, including Base-plates ...	2	2	0	2	10	0	3	5	0	3	15	0
Height Gauges	3	9	0	3	9	0	4	0	0	4	5	0
Grinding Face and Taper of Dies, per Set	0	3	3	0	3	3	0	5	0	0	6	0

Prices are subject to alteration without notice.

When ordering Dies it is always necessary to specify the Size and Style of the Diehead in which they are intended to be used (which particulars are stamped on the body of the Diehead); otherwise mistakes and delays are likely to occur, for which we cannot accept any responsibility. It is also necessary to state the material to be screwed as "mild steel," "chrome nickel steel," "brass," "copper," "gunmetal," etc. If dies that are duplicates of existing ones are required, the letter or letters on the dies should also be stated.

CLASSES OF DIES.

Class I Dies as specified hereunder, are supplied at standard prices. In some of the systems, dies for certain sizes of dieheads only are carried.

British Standard Whitworth Threads ... ...
†British Standard Fine Threads ... ...
*British Standard Pipe Threads ... ...
*Whitworth Gas Threads ... ...
British Association Threads ... ...
British Standard Brass Threads ... ...
Cycle Engineers' Institute Threads ... ...
Admiralty Fine Threads ... ...
Sparking Plug Threads ... ...
British Standard Threads for Steel Conduits ...
Systeme International Threads ... ...
United States Standard or Seller's Threads ...
Society of Automobile Engineers' Standard Threads ... ...
American Society of Mechanical Engineers' Standard Threads ... ...
Briggs' Standard Taper Threads... ... ...
$\frac{7}{8}''$, $\frac{15}{16}''$, 1″, $1\frac{1}{16}$, $1\frac{1}{8}''$ dies, 11 and 12 per inch, for copper, for 1″ diehead ... ...
$\frac{7}{8}''$, $\frac{15}{16}''$, 1″, $1\frac{1}{16}$, $1\frac{1}{8}''$, $1\frac{1}{4}''$, $1\frac{5}{16}''$, $1\frac{3}{8}''$ dies, 11 and 12 per inch, for copper, for $1\frac{1}{4}''$ diehead ...

All right hand threads.

†British Standard Fine Threads up to 1″ diameter are identical with British Standard Automobile Threads for bolts.

*British Standard Pipe Threads and Whitworth Gas Threads are identical in the great majority of sizes.

Class II Dies are those with pitch and profile of thread the same as Class I but for special diameters, and dies for left hand threads, taper threads, Acme threads, and threads with special pitch or profile; these are made only to order.

In the case of threads of special pitch and profile, where no tools are in existence, an additional charge of £7 is made to cover part cost of a special hob, which becomes our property.

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DRIFTS, PUNCHES, SCRAPERS.

Fig. 320. HAND-FORGED BEST CRUCIBLE HARDENED AND TEMPERED ICE PICKS.

Size of Blade, inches	5	6	7	8	9	10
Price per dozen, Blades only	**4/6**	**5/3**	**6/6**	**9/9**	**13/–**	**17/–**
" " Handled Extra Plain Tangs, all sizes						**4/–**
" " Handled Extra Through Tangs, all sizes						**6/6**

SQUARE DRIFTS.

Fig. 321. SQUARE DRIFTS.

Size, inches	1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	13/32	7/16	15/32	1/2	17/32	9/16	19/32	5/8	21/32
Price each	**2/3**	**2/3**	**2/3**	**2/6**	**2/9**	**3/–**	**3/6**	**3/9**	**4/-**	**4/6**	**5/–**	**5/3**	**5/9**	**6/–**	**6/6**	**6/9**	**7/–**	**7/6**
Size, inches	11/16	23/32	3/4	25/32	13/16	27/32	7/8	29/32	15/16	1	1 1/16	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8	1 7/16	1 1/2
Price each	**8/–**	**8/3**	**8/9**	**9/–**	**9/9**	**10/6**	**11/3**	**12/–**	**12/9**	**15/–**	**16/6**	**18/–**	**19/6**	**21/–**	**22/6**	**24/–**	**25/6**	**27/–**

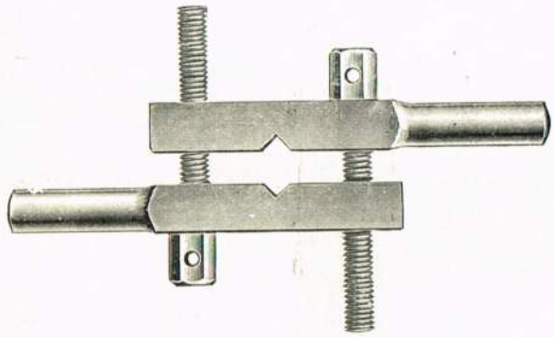

Fig. 217. CAST STEEL LATHE CARRIERS.

Points to consider :—

1. Centre of weight is in centre line of lathe, so that with a small cut on, the work does not swing round.
2. Two screws—in place of one—to take strain.
3. For heavy work both driving pins can be used.
4. Holds any shape well.
5. Weight for weight, much stronger than the ordinary C.I. carrier.

	3/8in. bars holds to 1¼in.	1/2in. bars holds to 1½in.	5/8in. bars holds to 2in.	3/4in. bars holds to 2½in.	1in. bars holds to 3in.	
Price ...	**3/6**	**4/6**	**6/–**	**11/–**	**17/6**	each

Fig. 322. BELL CENTREING PUNCH.

	Polished.	Knurled.	Accurate.
Capacity ...	3/8 to 1½	7/16 to 2¼ inches.	
Price	**3/9**	**5/3**	each.

Fig. 323. ROUND SHANK MACHINE DRILLS.

Size Shanks	1/4	5/16	3/8	7/16	1/2	5/8	3/4
Price per dozen	**2/10**	**3/10**	**4/10**	**7/6**	**10/6**	**14/–**	**17/6**

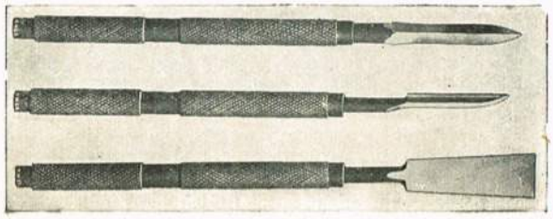

Fig. 324. SOLID STEEL BEARING SCRAPERS.

Specially made of Crucible Cast Steel, hardened for toolmakers. Made solid throughout. Knurled handles.

Price, Set of Three ... ... **4/3** per Set.

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PUNCHES, Etc.

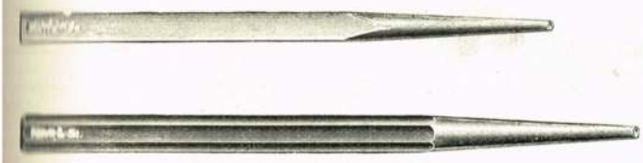

Fig. 325. BEST QUALITY MOTOR PUNCHES.

Size	7× 5/16	7× 3/8	7× 7/16	7× 1/2 inches Oct.
Price	**5/6**	**6/-**	**7/6**	**10/-** dozen

Made hard rolled brass, 7× 5/16 inches, **6/6** dozen.

Fig. 326. HAND RAIL PUNCHES.

Cast Steel, hardened, tempered and polished.
Price, **5/6** per dozen.

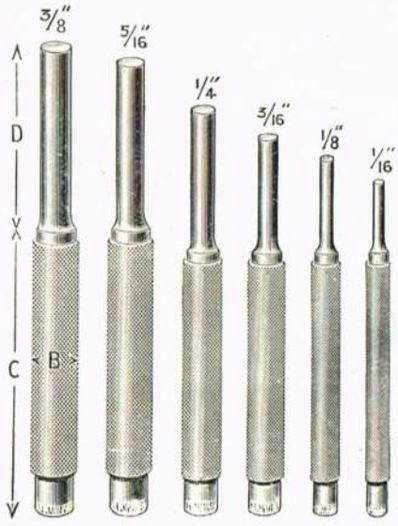

Fig. 328. SET OF 6 PIN PUNCHES.

Price, **3/9** per set.

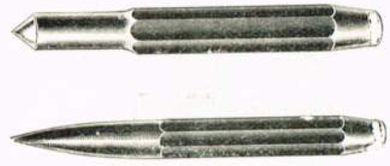

Fig. 327. CENTRE AND HOOP IRON PUNCHES.

Sizes	4× 5/16	4× 3/8	4× 7/16	4× 1/2	4 1/2× 5/8	5× 3/4
Price, dozen	**4/-**	**4/9**	**5/6**	**6/6**	**10/-**	**15/-**

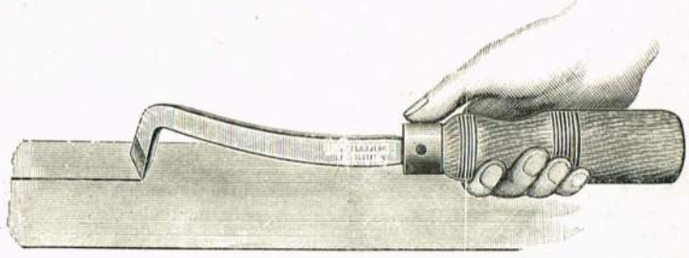

Fig. 329. ZINC CUTTERS.

Useful for cutting up sheet zinc. Also can be had with longer bevel for lino. With best Beech, with large rivet through ferrule.
Price, **20/-** dozen.

Fig. 330. HARD AND DURABLE HEAVY BURNISHERS.

Sizes, inches ...	3	4	5	6	7	8	10	12
Oval, price, dozen	**4/-**	**5/-**	**7/-**	**9/-**	**13/6**	**20/-**	**40/-**	**60/-**
Handled, extra ...	**4/-**	**4/-**	**4/-**	**5/-**	**5/-**	**6/-**	**7/-**	**10/-**

Fig. 331. STRIKING KNIVES OR SCRIBERS.

Price, **7/6** per dozen.

Fig. 332. SCRIBERS BEST CRUCIBLE CAST STEEL.

Price, **7/-** per dozen.

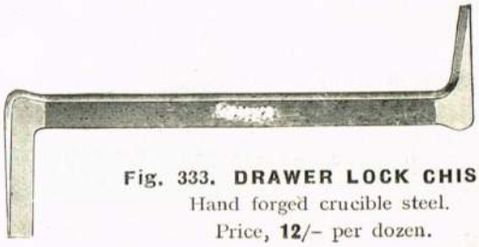

Fig. 333. DRAWER LOCK CHISEL.

Hand forged crucible steel.
Price, **12/-** per dozen.

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NAIL SETS AND CENTRE PUNCHES.

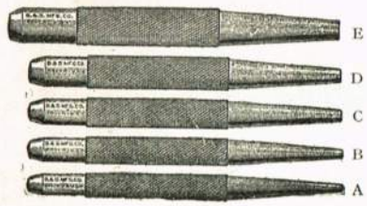

Fig. 334.
(No. 762). Brown & Sharpe Nail Sets.
4″ long. Hardened tool steel. Knurled.

Size	A	B	C	D	E
Diam. at point	1/16″	3/32″	1/8″	5/32″	7/32″
Price each	**1/1**	**1/1**	**1/1**	**1/1**	**1/3**

Per doz. assorted, **11/6.**

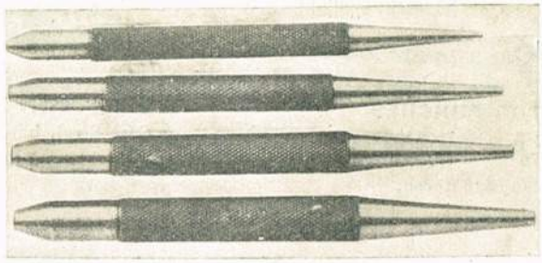

Fig. 335. Finely made **Knurled Punches**, tempered tool steel.

Length, inches	3¾	3⅞	4	4⅛
Price per doz.....	**7/–**	**7/–**	**7/–**	**7/–**

Fig. 336. (No. 490/3) Millers Falls.
½″ diam. Point and head polished.

Nos.	490	491	492	493
Diam. at points	3/16″	¼″	5/16″	⅜″
Length	9″	9″	9″	9″
Price per doz.	**14/4**	**14/4**	**14/4**	**14/4**

Fig. 337 (Nos. 480/3) Millers Falls and (No. 380/4).
½″ diam. Point and head polished.

Nos.	480	481	482	483
Diam. at point	3/16	¼″	5/16″	⅜″
Length	6″	6″	6″	6″
Price per doz.	**8/11**	**8/11**	**8/11**	**8/11**

Nos.	380	381	382
Diam. at point	⅛″	5/32″	3/16″
Diam. of body	5/16″	5/16″	⅜″
Length	4″	4″	4″
Price per doz.	**4/2**	**4/2**	**4/2**

Nos.	383	384
Diam. at point	7/32″	¼″
Diam. of body	⅜″	⅜″
Length	4″	4″
Price per doz.	**4/2**	**4/2**

All tools shewn are carefully made and are thoroughly reliable.

Fig. 338.
(No. 451/5). Millers Falls. Large striking surface. Tool will not roll off bench.

Nos.	451	452	453
Diam. of point	1/32″	1/16″	3/32″
Diam. of body	5/16″	5/16″	5/16″
Length	4″	4″	4″
Price gross	**53/1**	**53/1**	**53/1**

Nos.	454	455
Diam. of point	⅛	5/32
Diam. of body	5/16″	5/16″
Length	4″	4″
Price, gross	**53/1**	**53/1**

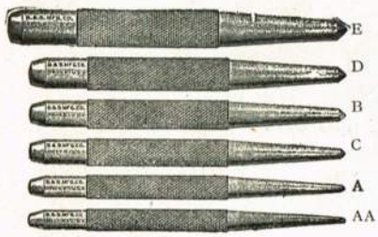

Fig. 340.
(No. 765.) Brown & Sharpe Machinists' Centre Punches.
Carefully tempered; with knurled handles. 4″ long.

Size	AA	A	B
Diam. of top of tapered point....	1/16″	5/64″	3/32″
Price each	**1/1**	**1/1**	**1/1**

Size	C	D	E
Diam. of top of tapered point	9/64″	5/32″	15/64″
Price each	**1/1**	**1/1**	**1/1**

Per dozen assorted, **11/6.**

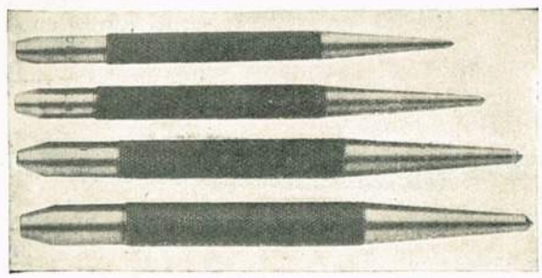

Fig. 342. Machinists' Centre Punches.

Length, inches	3¾	3⅞	4	4⅛
Price per doz.....	**7/–**	**7/–**	**7/–**	**7/–**

Fig. 341.
(No. 460). Millers Falls Square Head Centre Punches, provided with large square head, and will not roll off the bench. Bright finish. Head ⅜″ square. Length overall 4″. Body 5/16″ diam.
Price **4/5** per doz.

Fig. 343. (No. 117). Starrett Centre Punches.

Size	A	B	C	D	E
Diam.	5/64	3/32	9/64	5/32	¼ ins.
Price each	**1/–**	**1/–**	**1/–**	**1/–**	**1/3**

Assorted—A, B, C, D—**10/–** per doz.

Fig. 344. (No. 118). Starrett Spacing Centre Punch.
This combination Prick Punch and Spacing Tool is just the thing for laying off work quickly and accurately. Has a variation from 5/64 to ⅜ inches.

Fig. 345. (No. 119). Starrett Nailholder and S.E.
The nail may be instantly placed under the spring in the lower end of the holder and there retained by the pressure of same, ready to be driven home.
Price .... **1/3** each.

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SADDLERS' PUNCHES.

IMPROVED WELDLESS HOLLOW STEEL BAND PUNCHES FOR SADDLERS AND MECHANICS.

We strongly recommend this punch, and guarantee every punch to clear itself freely.

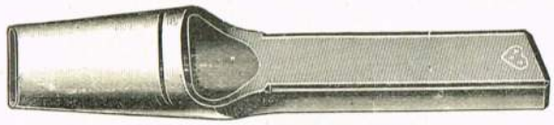
	ins.	1/16 to 3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2
		00 0 1 to 6	7	8	9	10	11	12	13	14
Fig. 346	...	12/– 11/– 9/6	11/–	12/–	13/–	16/–	19/–	22/6	25/6	29/–
Fig. 347 Bright all over...	...	13/– 12/– 11/–	13/–	13/6	15/6	18/6	21/6	24/6	29/–	32/–

	ins.	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1	1 1/8	1 1/4
		15	16	17	18	19	20	21	22	23	24
Fig. 346	...	33/6	39/–	48/–	58/–	80/–	96/–	106/–	115/–	154/–	192/–
Fig. 347 Bright all over...	...	37/–	42/–	—	—	—	—	—	—	—	—

Hand Forged Saddlers' Hollow Punches.

	ins.	1/16 to 3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16
		0 1 to 6	7	8	9	10	11	12	13
Fig. 348	...	20/– 16/–	17/6	19/–	21/6	24/–	28/–	31/–	36/– doz.

	ins.	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1
		14	15	16	17	18	19	20	21	22
Fig. 348	...	41/6	47/–	53/6	60/–	67/–	80/–	94/–	104/–	112/– doz.



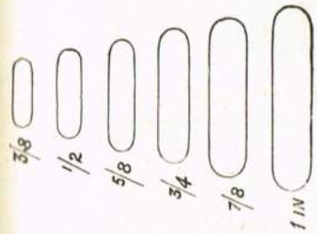


Fig. 349. Crew Punches.

3/8	1/2	5/8
40/-	48/-	56/- doz.
3/4	7/8	1 in.
65/-	72/-	81/- doz.

Prices quoted for Saddlers' Pricking Irons on receipt of enquiry stating size and quantity required.

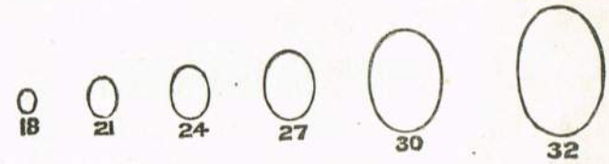


Fig. 350. Saddlers' Oval Punches.

18-22	23	24	25	26	27	28	29	30	31	32
20/-	23/-	25/6	28/-	31/-	33/6	36/-	43/6	47/-	53/6	58/- doz.

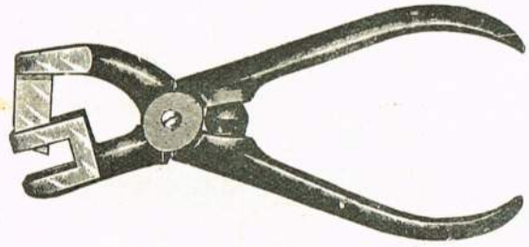
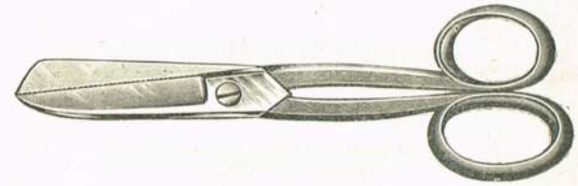


Fig. 351.

Improved Pattern Punch Plier.

For Green's Belt Fasteners, with Spring, **7/2** each.



Shears for Cutting Leather.

8 ins. long.

Will cut leather ½ in. thick with the greatest ease.

Fig. 352. .... **88**/– doz.

A child could cut the thickest bands without any difficulty with one of these.

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TINMEN'S TOOLS, Etc.

Fig. 353. RIVET SETS. Best forged cast steel.

Size of oct, bar	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$
Holes up to, inches ...	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{7}{32}$
Price per dozen... ...	**15/–**	**16/–**	**19/–**	**22/–**	**28/–**
Size of oct. bar, inches.	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$
Holes up to inches ...	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
Price per dozen... ...	**32/–**	**36/–**	**44/–**	**52/–**	**60/–**

Fig. 354. TINMEN'S GROOVERS. Best Quality.

Size of Grooves, in....	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
Price per dozen... ...	**30/–**	**30/–**	**30/–**	**36/–**	**40/–**
Size of Grooves... ...	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	
Price per dozen... ...	**44/–**	**48/–**	**60/–**	**72/–**	

Fig. 355. TINMEN'S BEST CRUCIBLE CAST STEEL PUNCHES.

Assorted Points.

Size, inches	$5\times\frac{7}{16}$	$6\times\frac{1}{2}$	$7\times\frac{5}{8}$	$8\times\frac{3}{4}$ inches
Price per dozen	**7/–**	**9/–**	**13/–**	**18/–**

Fig. 356. TINMEN'S BEST CRUCIBLE STEEL HOLLOW PUNCHES.

Size, inches	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$
Price each ...	**1/2**	**1/4**	**1/6**	**1/8**	**1/10**	**2/–**	**2/4**	**2/6**
Size, inches	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Price each ...	**2/8**	**3/–**	**3/4**	**4/2**	**5/–**	**5/10**	**6/8**	**7/6**
Size, inches	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$
Price each ...	**8/4**	**9/2**	**10/8**	**12/2**	**15/–**	**16/–**	**19/–**	**21/–**

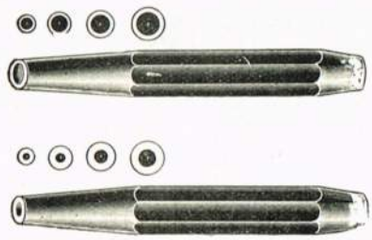

Fig. 357. TINMEN'S CAST STEEL RIVET PUNCHES.

Hardened and well finished either "fetch-ups" or "snaps."

Size bars oct., inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Price per dozen...	**7/–**	**8/6**	**11/–**	**15/–**

Fig. 358. CORRUGATED IRON CHISEL AND POINT PUNCHES

Very useful for cutting corrugated iron. The punch is for regular size screws used in this work. Made from high grade cast steel, well finished. Chisels, price, **17/–** dozen; Punches, price **15/–** dozen.

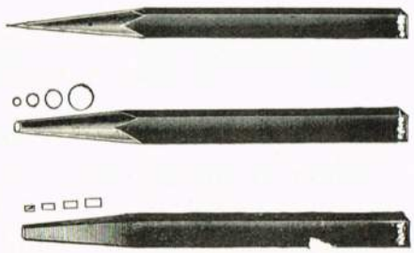

Fig. 359. BEST CRUCIBLE STEEL BRAD PUNCHES.

Square, round and pin points	**32/–** per gross.
Needle point	**32/–** ,, ,,

Fig. 360. Best Steel Hardened and Tempered CARVERS' PUNCHES

Points milled by special process and exactly equal.

Square, inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
Price per dozen	**8/–**	**10/–**	**12/–**	**15/–**

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PLUMB BOBS, PUNCHES, SCRIBERS.

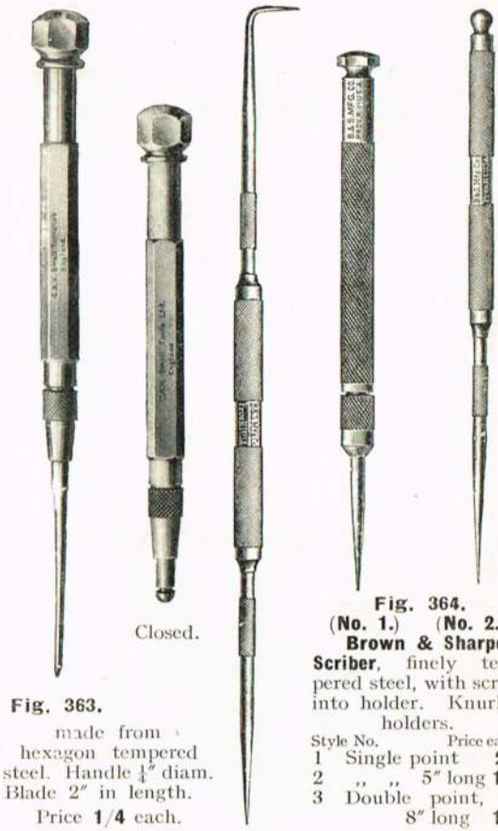
Fig. 361. Brown & Sharpe (No. 790) Mercury Plumb Bobs.

An important feature is the device for fastening the string without a knot. After unwinding the required length, the cord is inserted in a slot in a taper stud, and the knurled cap, which has a taper hole, is forced over it, thus making the bob hang true.

These plumb bobs are made from a solid steel rod, bored out and filled with mercury, or quicksilver, which makes them unusually heavy in proportion to their size. The centre of gravity is low. The cut at the left shows the manner in which these plumb bobs are constructed. The comparatively small diameters allow them to be used close to corners and walls. They are not easily affected by draughts of air, and may be conveniently carried or packed in small spaces.

The points are hardened, and the bodies and points are ground. The plumb bobs are nickel plated, and each is furnished with a braided silk line. The 3½ oz. can be carried easily in the vest pocket.

Weight ozs.	Length inches	Diam. inches	Price each
3½	4	½	**7/6**
6	4½	9/16	**10/–**
12	5⅜	⅝	**12/6**
16	6	1	**15/–**



Closed.

Fig. 363.

made from hexagon tempered steel. Handle ¼″ diam. Blade 2″ in length.

Price **1/4** each.

Fig. 364.
(No. 1.) **(No. 2.)**
Brown & Sharpe Scriber, finely tempered steel, with screw into holder. Knurled holders.

Style No.		Price each.
1	Single point	**2/-**
2	,, ,, 5″ long	**1/6**
3	Double point, 8″ long	**1/9**

(No. 3.) **Fig. 364**

Automatic Centre Punches.

Fig. 362

(No. 770). Made of steel, striking mechanism being enclosed in the knurled handle. A downward pressure releases the striking block. The punch marks are of uniform depth. The points of Styles 2 and 3 can be removed for grinding. Style 1 is the Pocket Model.

Style **1**.	Length 4⅛″, diam. ⅜″	.... Price	**8/3**
Style **2**.	Length 5¼″, diam. ⅝″	.... ,,	**12/6**
Style **3**.	Length 6″, diam. ¾″	.... ,,	**16/9**

Extra points for Nos. 2 and 3 .... **9d.** each.

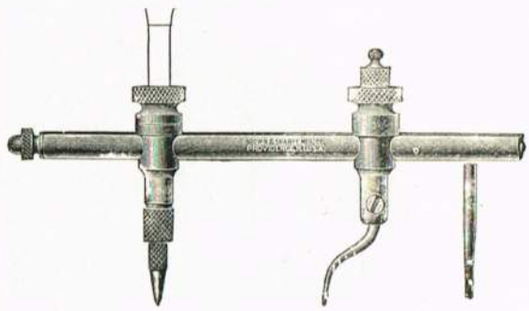
(No. 771.) Similar to No. 770, but is provided with a knurled knob which controls the adjustment or the pressure of the stroke.

Price, one size only, **14/6.** Length 5¼″; diam. ⅝″.
Extra points, **9d.** each.

(No. 775). Spacing attachment to be used with No. 770 (Style 2) or No. 771 punches for spacing or laying out work, and is adjustable.

Beam 4″ long.

Price **12/6** each. Points, **9d.** each.



No. 770. No. 775. No. 771.

Fig. 365. (No. 87) Starrett Improved Mercury Plumb Bob.

The improvement consists in our patented device for fastening the string without a knot to tie or untie, simply by drawing it into the peculiarly slotted neck at the top, after unwinding the required length, when the bob will hang perfectly true.

These plumb bobs are made from solid steel, bored and filled with mercury. Noteworthy features are their great weight in proportion to size, low centre of gravity, small diameter, hardened and ground points, knurling on the body and the simple and effective device at top for fastening end of line after winding up. Nickel plated. Each is provided with a braided silk line.

PRICES.

4″ long,	½″ diam.	3½ ozs.	**7/6**
5″ long,	⅝″ diam.,	6 ozs.	**10/–**
5½″ long,	⅞″ diam.,	12 ozs.	**12/6**
6″ long,	1″ diam.,	16 ozs.	**15/–**

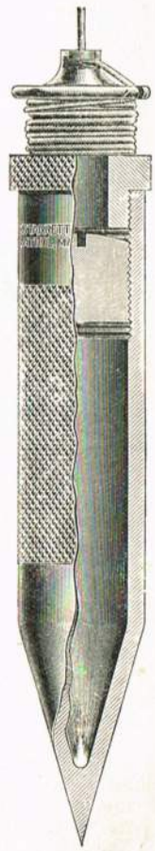


Fig. 366 (No. 177). Starrett Steel Plumb Bob.

The same design as No. 87, but made from solid steel, the mercury being omitted.

PRICES.

4″ long, ½″ diam., 2¾ ozs.	.... **4/3**	5½″ long, ⅞″ diam., 8½ ozs.	.... **7/6**
5″ long, ⅝″ diam., 5 ozs.	.... **5/3**	6″ long, 1″ diam., 14½ ozs.	.... **10/–**

Above numbers packed 1 in a box.

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SURFACE GAUGES.

These surface gauges have been so designed that a wide range of adjustments can be reaedily made by means of the knurled adjusting screw.

The spindle and the bolt and bushing through which it passes are locked in the position of approximate adjustment by the knurled nut at the boss on the base. The fine adjustment can then be used to obtain the exact setting.

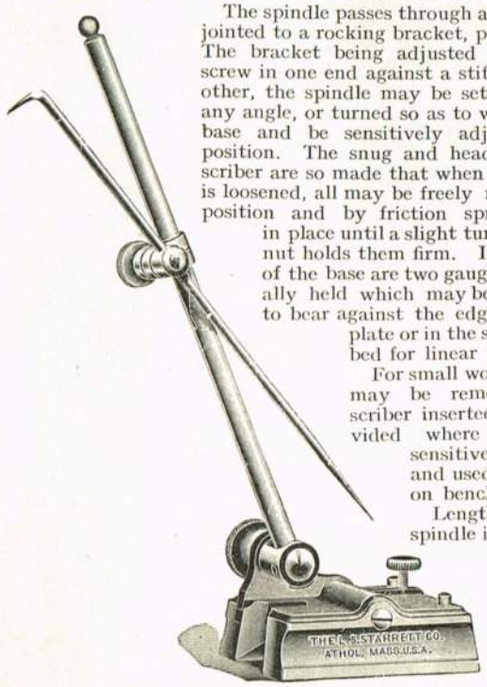
The base is of a form most convent to handle. A V-shaped groove in the bottom especially adapts it for cylindrical work. It has two gauge pins in the rear end that can be pushed down and used against the edge of a plate or the side of a T-slot.

The spindle swivels can be securely clamped in any position from the vertical to the horizontal, and the scriber may be used below the base as a depth gauge. For small work the spindle may be removed and the scriber inserted in a hole in the spindle swivelling bolt, where it is readily adjusted.

Fig. 370.

Fig. 372. THE STARRETT No. 57 UNIVERSAL SURFACE GAUGE

Heavy base, grooved through the bottom and end, adapting it for use on or against circular work as well as flat surfaces.



The spindle passes through a rotating head jointed to a rocking bracket, pivoted in base. The bracket being adjusted by a knurled screw in one end against a stiff spring in the other, the spindle may be set upright or at any angle, or turned so as to work under the base and be sensitively adjusted to any position. The snug and head carrying the scriber are so made that when the clamp nut is loosened, all may be freely moved to any position and by friction springs retained in place until a slight turn of the clamp nut holds them firm. In the rear end of the base are two gauge pins frictionally held which may be pushed down to bear against the edge of a surface plate or in the slot of a planer bed for linear work.

For small work the spindle may be removed and the scriber inserted in hole provided where it can be sensitively adjusted and used to advantage on bench work.

Length given for spindle includes height of spindle and base; except the 12″ spindle with 57B and the 18″ with 57D the depth of the base not being included in the length of these two spindles.

PRICES.

Fig. 372.	**No. 57A.**	3″ base with 9″ spindle	....	**14/9**
	No. 57B.	3″ base with 9″ and 12″ spindles	....	**16/9**
	No. 57C.	$3\frac{3}{4}$″ base with 12″ spindle	....	**17/6**
	No. 57D.	$3\frac{3}{4}$″ base with 12″ and 18″ spindles	....**£1**	**0 0**

BROWN & SHARPE UNIVERSAL GAUGES.

Fig. 370 (Nos. 620/622).

No.	sdle	base	base	
620	4″	$2\frac{1}{4}$″ × $1\frac{1}{2}$″	**14/6**	**17/-**
621	9″	$3\frac{1}{8}$″ × $2\frac{1}{2}$″	**14/6**	**19/9**
621	9″ and 12″	$3\frac{1}{8}$″ × $2\frac{1}{2}$″	**16/9**	**22/-**
622 Heavy base	**12″**	4″ × $3\frac{3}{8}$″	**17/3**	**22/6**
622	12″ and 18″	4″ × $3\frac{3}{8}$″	**19/9**	**25/-**

STARRETT TOOLMAKERS' UNIVERSAL SURFACE GAUGE,

Fig. 371 (No. 56).

This gauge is admirably adapted for light weight. The base is case-hardened. Height 10 ozs. 5″ high. An auxiliary hardened steel guide is provided to clamp to the base.

Fig. 371 (No. 56A.) 4″ spindle, **14/9**; with 7″ spindle, **16/-**.
Auxiliary guide, **2/9**.

GUIDE.

Fig. 371.

Fig. 373. SET OF STANDARD TOOLS No. 849.

For students and apprentices.

Contains the following tools:
No. 300—6″ tempered steel rule, No. 4 graduation.
No. 402—6″ combination square, No. 4 graduation (with drop-forged heads).
No. 650—60° Centre gauge.
No. 765—Centre punch ($^{9}/_{64}$″ at top of tapered point).
No. 810—5″ Rex divider, solid nut.
No. 811—6″ Rex outside caliper, solid nut.
No. 812—6″ Rex inside caliper, solid nut.
" Handbook for Apprenticed Machinists."

Price .... **£2 1 9.**

Furnished in a nicely finished wooden box.

The " Handbook for Apprenticed Machinists " included with the set, contains many useful hints and instructions in the proper way to perform a large variety of operations common to machine shop practice.

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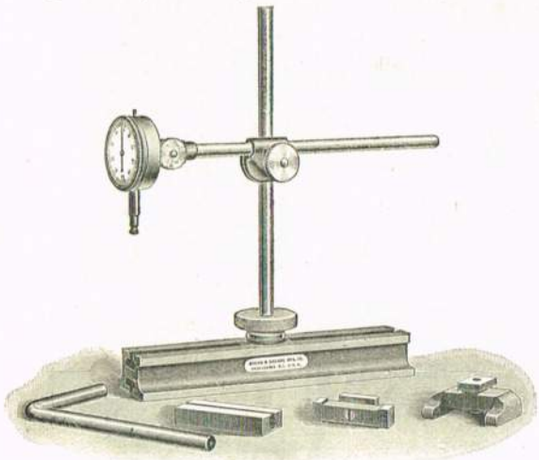
TEST INDICATORS.

Fig. 375 (No. 730.) Dial Test Indicator.



English or metric measure. Diameter of dial $1\frac{3}{4}''$. Spindle has $\frac{1}{4}''$ movement (metric 7m/m). Length of base, $8\frac{1}{2}''$. Width $2\frac{1}{4}''$.
Price .... **£6 5 0.**

This indicator is especially serviceable to erectors or inspectors of machines, for determining the inaccuracy in a surface or the movements of a spindle or arbor, etc.

The parts are adjustable to any angle. The arm can be removed from the post and used independently, as in the tool post of a lathe. The points are removable to permit the use of different forms. The movement of the measuring surface that bears upon the work is magnified a number of times and indicated by the pointer.

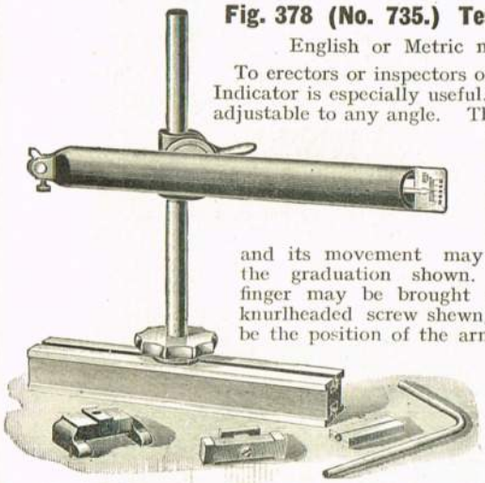
English Measure. The dial reads to thousandths of an inch, has a white enamel face and is adjustable to allow the setting of the zero to any required position.

Metric Measure. Also made with metric dial which reads to hundredths of a millimetre.

Fig. 378 (No. 735.) Test Indicator.

English or Metric measure.

To erectors or inspectors of machines this Indicator is especially useful. The parts are adjustable to any angle. The movement of the point is magnified a number of times by the length of the index finger, and its movement may be read upon the graduation shown. The indexing finger may be brought to zero by the knurlheaded screw shewn, whatever may be the position of the arm.



English Measure. The scale reads to thousandths of an inch.
Metric Measure. Also made to read to fiftieths of a millimetre.
Length of base, 8″. Height of post, 9″.
Price **£5 4 3**

Fig. 379. (No. 65). Centre Tester.

For adjusting or locating the centre of a piece of work held in lathe chuck or testing a shaft held between lathe centres.

Price .... **15/9 each.**

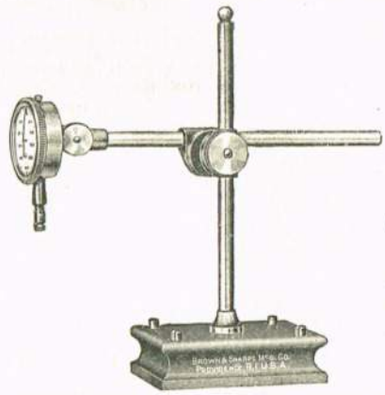


Fig. 376 (No. 733.) Dial Test Indicator.

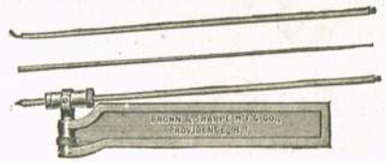
English or Metric measure
Diameter of dial $1\frac{3}{4}''$.
Spindle has $\frac{1}{4}''$ movement (metric 7m/m).
Length of base $4\frac{1}{4}''$.
Width $3\frac{1}{4}''$. Thickness $1\frac{1}{8}''$
Price .... **£5 0 0.**

Differs from Dial Test Indicator No. 730 shown opposite, in the design of the base, which is large and sufficiently heavy to give a firm support. It has four gauge pins at the corners that can be pushed down and used against a plate, straight edge or the side of a T-slot. The form of the base permits a good hand grip when moving the indicator.

English Measure. The dial reads to thousandths of an inch, has a white enamel face, and is adjustable to allow the setting of the zero to any required position. The spindle has $\frac{1}{4}''$ movement.

Metric Measure. Also made with a metric dial that reads to hundredths of a millimetre. The spindle has a movement of 7 millimetres.

Fig. 377 (No. 736.) Lathe Test Indicator.

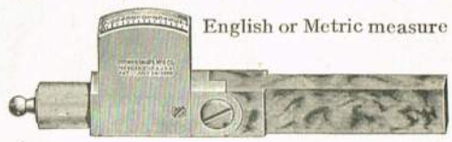


Price **15/9**

Made of steel and of such a size as to be held conveniently in the tool post of a lathe. The bar, $^{15}/_{16}''$ wide and $\frac{3}{8}''$ thick, is drop forged and formed at the end to receive a universal joint for supporting the finger holder.

A clamp nut is provided for clamping the joint when it is desired to have only a vertical movement to the finger, as in testing pieces held between centres, the outside or inside of pulleys, etc. The bushing which holds the finger is split, thus allowing the finger to be adjusted to lengths required and clamped in position. The finger holder is furnished with two fingers, either one of which can be quickly attached ; one finger is ground to an angle of 60 degrees and the other is bent for outside and inside testing. A spiral spring is provided for holding the finger against the work with an even pressure.

Fig. 380. (No. 738.) B. & S. Indicator



English or Metric measure

Price .... **£2 1 9** including wooden case.

For use in setting centrally any point or hole in a piece of work to be operated upon in a lathe or upon a face plate, also for testing lathe centres, shafting and other work held between centres, the inside and outside diameters of cylinders, pulleys, etc., and work of a similar nature. The shank is made of hardened steel and is designed to be held in the tool post of a lathe. By means of the swivel at one end of the shank, the indicator may be adjusted either upwards or downwards and readings obtained. The indicator point is of steel, hardened, and is made spherical, allowing of pressure being brought upon it by the work from any angle and readings taken. The readings are obtained by means of the pointer and scale on the top of the case.

English Measure. The scale is graduated to read by thousandths of an inch to approximately ·007″ either side of zero. In this way the amount that the piece may run out of true, both under and over size, is easily ascertained.

Metric Measure. Also made to read by hundredths of a millimetre to approximately 1 m/m either side of zero.

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CYLINDER GAUGE, DIAL, and SPEED INDICATORS.

Fig. 381 (No. 452.) Cylinder Gauge.

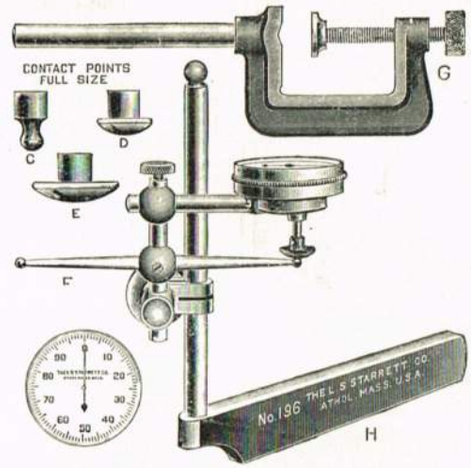
This illustration shows our new cylinder gauge. Mechanics in motor service, re-grinding and re-boring shops pronounce it the ideal gauge for determining tapered, out-of-round or scored cylinders.

No more difficulty in convincing a car owner the necessity of truing up cylinders. Use the gauge before him; it shows him instantly the condition of the cylinders to a one-thousandth part of an inch. After the variation of the bore has been determined, note the reading on the dial and transfer to an outside micrometer to find the diameter. (See next page).

This gauge is of rugged construction and has a non-breakable crystal over the dial. The dial is mounted on a block which moves at right angles to the sled. The sled has two line contact points which are at all times in alignment with the walls of the cylinder. Two contact points (hardened) which independently cause the hand to travel over the dial reading in .001 and with a unique double spring action makes the gauge self-centering and absolutely non-collapsible. Provisions for diameters varying from 2½ inches to 6 inches are made with two adjustable rods. These may be carried in the hollow handle of the gauge. The dial is graduated to show plus or minus, one turn of the hand being .100. By turning the knurled rim the dial may be instantly moved to bring the 0 mark to any point desired in relation to the hand. Nickel plated. Weight 12 ounces.

No. 452. Price **62/6.**

Fig. 382 (No. 196.) Universal Dial Test Indicator.



Can be adjusted to any angle. Circumference of dial divided into 100 equal spaces, each representing a movement of the contact point of one-thousandth of an inch. One revolution of the hand therefore indicates one-tenth of an inch, the capacity of the instrument being two-tenths. By bringing the contact point against the work with just enough pressure to give the hand one full turn, then setting it at 0, an opportunity is given for one full revolution of the hand to both right and left of 0, showing a rise or drop in the work and the amount of variation. A most valuable feature is the adjustable dial. By turning the knurled rim the dial may be instantly moved to bring the 0 mark to any point desired in relation to the hand. Each indicator is fitted with three hardened contact points for different classes of work. The special tool post holder and sleeve are useful in lathe work. For general work the indicator with sleeve K is adapted for use with our 9 inch or 12 inch surface gauges.

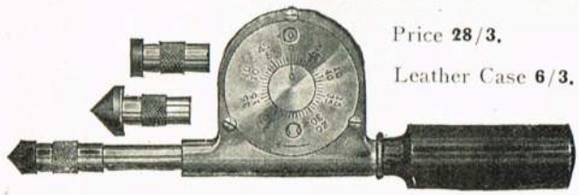
The clamp G permits attaching the indicator to large lathe and planer tools, milling arbors, etc.

The attachment F more than doubles the value of the indicator, adapting it for use inside of holes, to reach over blockings on face plates, etc.

PRICES.

No. 196 A	Indicator with all attachments, as shown.....	**2/16/6**
No. 196 B	,, only, with 3 contact points	**1/17/6**
No. 196 F	Hole attachment	**7/6**
No. 196 G	Clamp 1 5/16″ capacity, flat or round	**3/9**
No. 196 H	Tool post holder ⅜″x¾″x6″	**3/9**
No. 196 K	Sleeve	**3/9**
Extra contact points, each		**9d.**

Fig. 383 (No. 748.) Brown & Sharpe Speed Indicator.



Price **28/3.**

Leather Case **6/3.**

This Speed Indicator accurately determines the revolutions of shaftings, etc., in either direction and measures both high and low speeds equally well. It has few parts, is simple in operation, and reliable.

The fibre handle is conveniently shaped and is an insulation against electricity. All the working parts are enclosed in a dull finished, heavily nickeled case. Three points are furnished as shown. The steel point is for ordinary speeds and the rubber points are for high speeds.

This Speed Indicator is very neat, light, and convenient to handle, with no rough edges or projections to interfere with its use. Wherever the R. P. M. are to be determined or maintained, one of these indicators should be on hand.

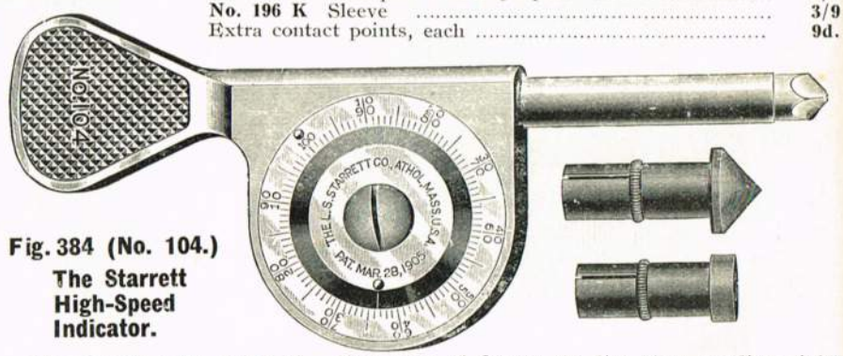


Fig. 384 (No. 104.) The Starrett High-Speed Indicator.

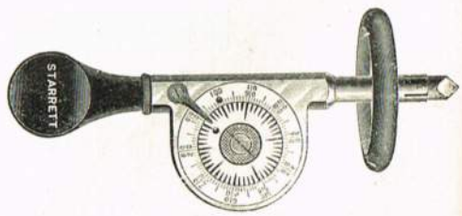
All working parts enclosed. Two rows of figures on dial plate, reading right or left as the shaft may run.

Price **5/3.** With Leatherette Case **11/-.**

Fig. 385

(No. 109.) Surface Speed Attachment.

Indicates the number of lineal feet per minute, and the shaft or pulley runs, when held against the periphery of a shaft or pulley a half minute or a minute, by dividing the figures showing the revolutions on the dial of the indicator by 2, the number of feet the surface of the object travelling is obtained, as each revolution of the indicator wheel shows six inches; twice around, one foot. Price **2/6** each.



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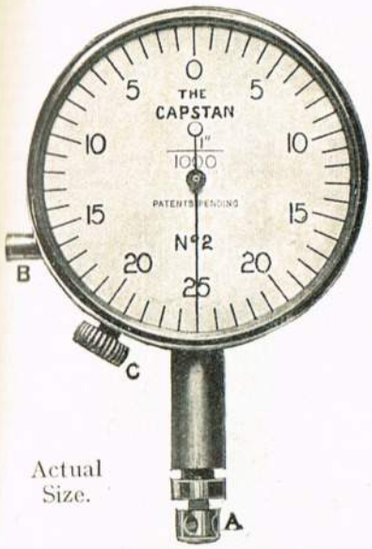
DIAL GAUGES AND EQUIPMENT



Actual Size.

The dial gauges are claimed to be really accurate instruments and, used in con junction with the various equipments are a means of obtaining close measurements, thus ensuring good, reliable workmanship. There are cheap grades of gauges on the market which are a positive danger to the good name of a firm, and an injustice to the mechanic. The capstan gauges are manufactured from the finest materials, under very close inspection, combined with 30 years' specialising in gauge work. The gauges can be supplied tested for accuracy at a trivial extra cost, and marked "First Grade" by the National Physical Laboratory. The plunger is provided with an adjustable screw A. The push pin B is for lifting the plunger when placing in position on delicate work. To obtain fine adjustment of needle, the milled screw C is also provided. The dial heads can be supplied either with British or metric readings.

Fig. 400. PRICES AND SPECIFICATIONS OF DIAL HEADS.

No.		
GO1.	As shewn on Fig. 5, having a tenon on the back adaptable to all fittings on the Capstan Equipment, and has no push pin C, nor screw C.	**£2 0 0**
G0.	Exactly as above, but having a ball to fit the cup fitting shewn on Fig. 5	**£2 0 0**
G1.	Reading .001 to 50, both sides of zero has push pin B and tolerance screw C	**£3 3 0**
G1A.	Reading from 0 to 100 right round dial, has push pin B and tolerance screw C	**£3 3 0**
G1B.	Reading .001 to 50 both sides of zero, but has no push pin nor tolerance screw. It has a flat back with 3 tapped holes set an equi-distance triangularly whereby engineers can fit own equipment	**£2 0 0**
G2.	As shewn, Fig. 1, reading .001 to 25 both sides of zero, has double magnifications of any of the above gauges and makes an excellent comparator, provided with drilled tenon on back to fit capstan equipment	**£3 3 0**
G2A.	Same specification as No. G 2, but reading 0 to 50 right round dial	**£3 3 0**
G5.	Same specification as No. G 2, but having a 3 in. dial gives still larger magnifications and clearer reading	**£5 5 0**
G5A.	Same specification as No. G 2, but having 3 in. dial but reading 0 to 50 right round dial	**£5 5 0**

No. G2 is the type usually supplied unless particularly specified, and is a thoroughly reliable instrument.

The above gauges can be supplied tested for accuracy and marked "First Grade" by the National Physical Laboratory at a charge of **7/6**, *i.e.*, Testing Fee.

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CAPSTAN DIAL GAUGE EQUIPMENT.

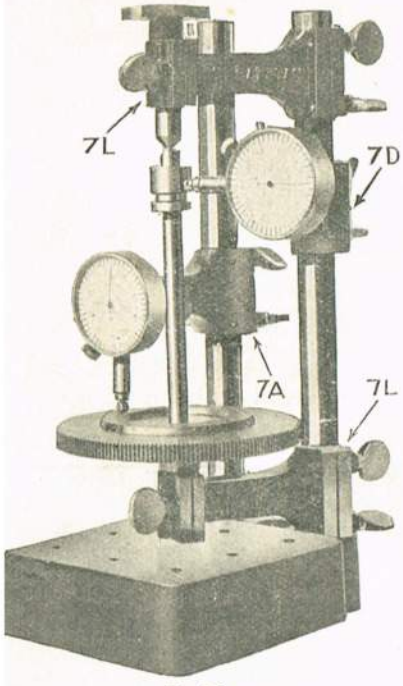

Fig. 2.

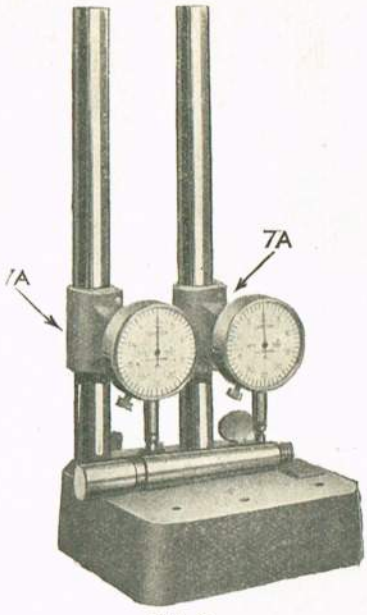

Fig. 3.

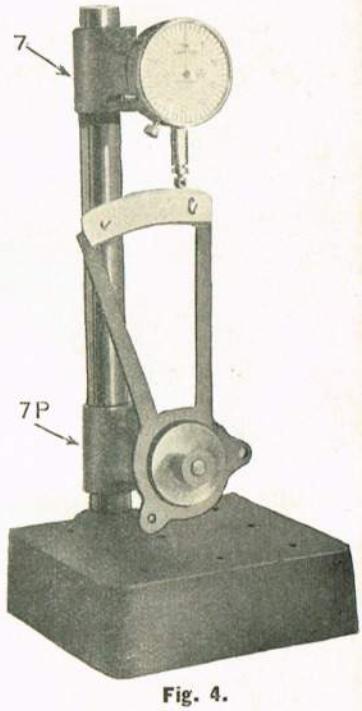

Fig. 4.

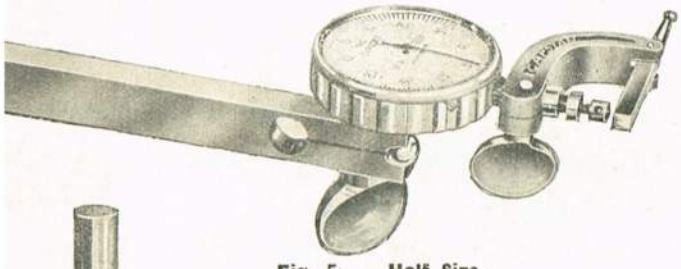

Fig. 5. Half Size.

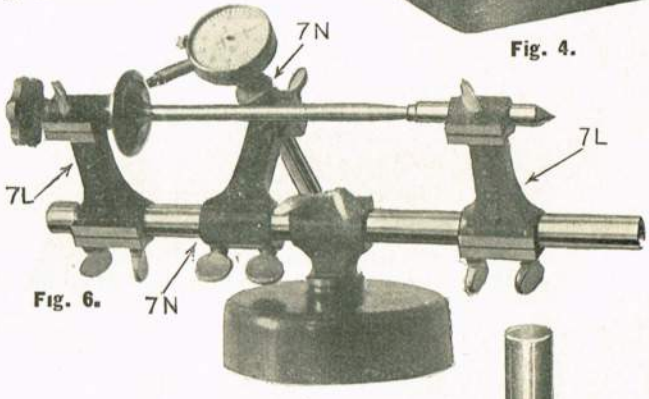

Fig. 6.

The illustrations represent only a few of the adaptions of the Dial Gauge. A larger number of accessories have been designed to meet the demand for almost any purpose. A photograph can be provided on receipt of specification of requirements.

The stands are perfectly machined top and bottom, and provided with a number of holes tapped, by means of which anvils, guides and any other accessories can be attached. All these equipments take work up to 7 in. high.

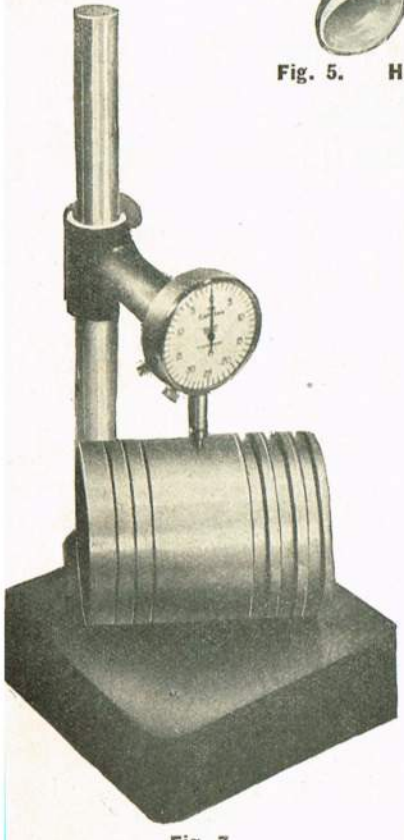

Fig. 7.

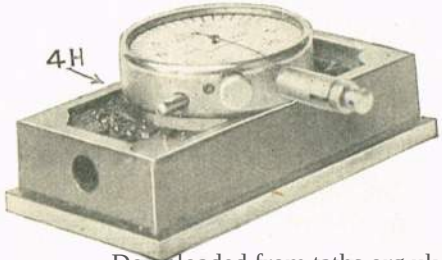

Fig. 8.

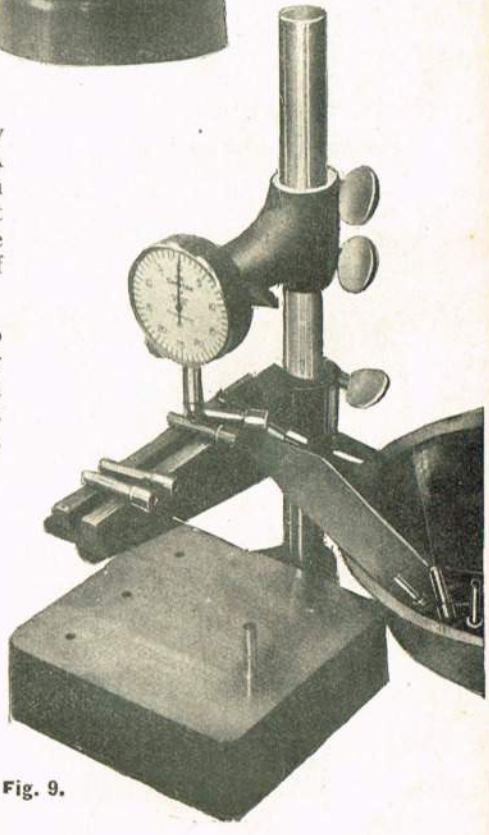

Fig. 9.

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CAPSTAN DIAL GAUGE EQUIPMENT

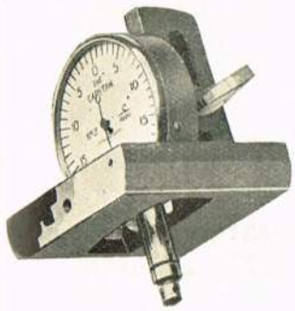

Fig. 11.

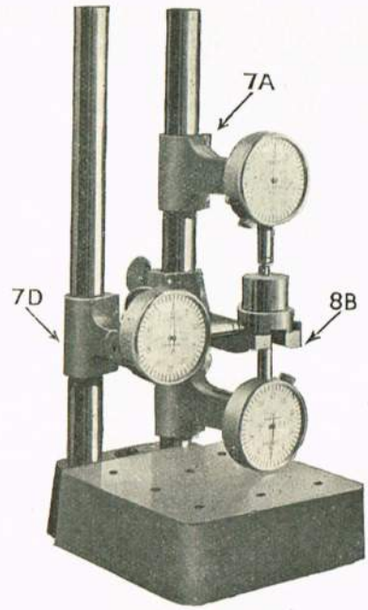

Fig. 10.

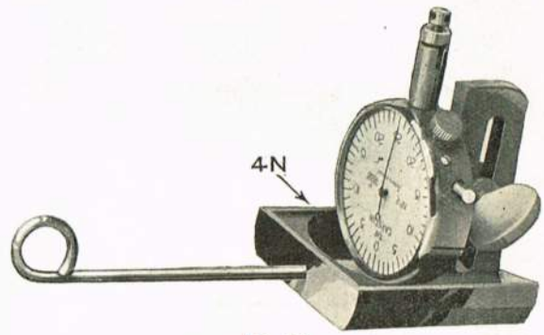

Fig. 12.

Fig. 400. Prices and Specification of Equipment.

Accurately Machined Bases. Fittings for every purpose.

		Price £	s.	d.
No. **E1**.	Cast iron circular base, $4\frac{1}{2}$ in. diam. with 1 steel post and 1 arm to carry dial head	**2**	**10**	**0**
No. **E2**.	Cast iron square base $4\frac{3}{4} \times 4\frac{3}{4}$ in., with 2 steel posts and 2 arms	**2**	**10**	**0**
No. **E2A**.	,, ,, ,, $4\frac{3}{4} \times 5\frac{3}{4}$ in. ,, 2 ,, ,, 2 ,, ...	**3**	**10**	**0**
No. **E3**.	,, ,, ,, $7\frac{3}{4} \times 7\frac{3}{4}$ in. ,, 1 ,, ,, 1 ,, ...	**3**	**5**	**0**
No. **E3A**.	,, ,, ,, $7\frac{3}{4} \times 8\frac{3}{4}$ in. ,, 2 ,, ,, 2 ,, ...	**4**	**5**	**0**
No. **E3B**.	,, ,, ,, $7\frac{3}{4} \times 8\frac{3}{4}$ in. ,, 3 ,, ,, 3 ,, ...	**5**	**5**	**0**
No. **E4**.	Cast iron circular base, $4\frac{1}{2}$ in. diam. with steel post only	**1**	**5**	**0**
No. **E4A**.	,, ,, ,, $4\frac{1}{2}$ in. diam., with T-socket and horizontal rod only, similar to Fig 6	**1**	**15**	**0**
No. **E4H**.	Heavy cast iron stand to carry a dial head is used in alignment testing fixtures, is slid along a straight edge on flat surface (see Fig. 8)	**0**	**15**	**0**
No. **E4N**.	Equipment for cylinder bore testing (see Fig. 12), and can be used as a depth gauge (see Fig. 11) (large size)	**1**	**12**	**0**
No. **E4NM**.	As **E4NL**, but medium size	**1**	**5**	**0**
No. **E4NS**.	As **E4NL**, but small size			
No. **E4N**.	Test Indicator Stand of usual pattern, with flat base and 4 spring pins, upright post, horizontal bar	**4**	**10**	**0**
No. **E4EE**.	Similar to E4E but the base is the lathe bed pattern, with the steel upright adjustable along ts length	**5**	**10**	**0**
No. **E4F**.	Similar to E4E, but extra heavy for erecting work	**6**	**0**	**0**
No. **E4K**.	Portiable stand to carry dial head and for testing the thickness or height of work on planers. Magnetic works, shapers, grinders, surface plates, etc., Made in 3 sizes, testing work from 0 to $4\frac{1}{2}$ in. high each	**0**	**18**	**0**
No. **E5**.	Lathe bar to carry any dial head	**0**	**6**	**6**
No. **E6**.	Cast iron stand for small work ; will take any dial head except No. 0 and 1B ; has lower anvil about $1\frac{1}{2}$ in. square and gauges up to $1\frac{1}{2}$ in. high	**1**	**5**	**0**
No. **E6A**.	Similar to No. E6, but has an adjustable and removable lower cylinder anvil, $\frac{1}{2}$ in. diam.	**1**	**5**	**0**

ACCESSORIES FOR EQUIPMENTS.

	Arms, Nos. **E7**, **E7A**, **E7B**, **E7C**, **E7D**. See illustrations .... each	**0**	**12**	**6**
	Arms, Nos. **E8B** and **E8E**. See illustrations Figs. 9 and 10	**0**	**15**	**6**
	Arms Nos. **E7L**, **E7N**, **E7P**. See illustration.	**0**	**15**	**6**
No. **E10F**.	Lever attachment. See Fig. 9 for internal work and for gauging under shoulders. Will fit any dial head	**0**	**12**	**6**
No. **E10**.	Same as No. **E10F**, but has a right-angle lever	**0**	**12**	**6**

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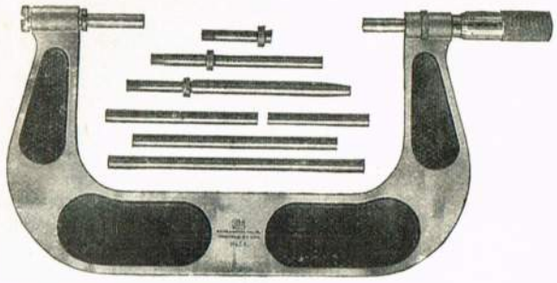
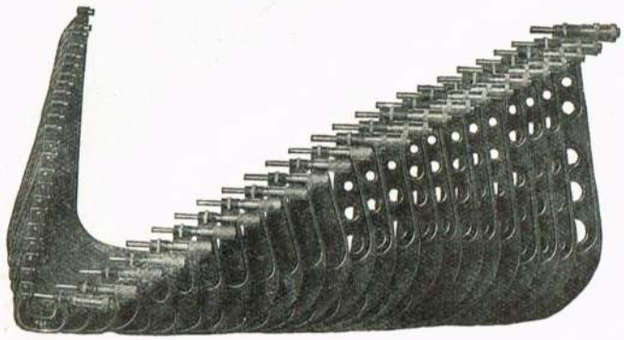
BROWN & SHARPE MICROMETERS.

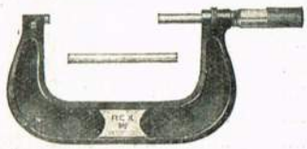




Range of Tools Nos. 59 to 88.

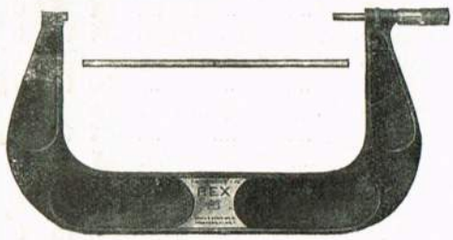
Rex No. 59.

Furnished with clamp ring.



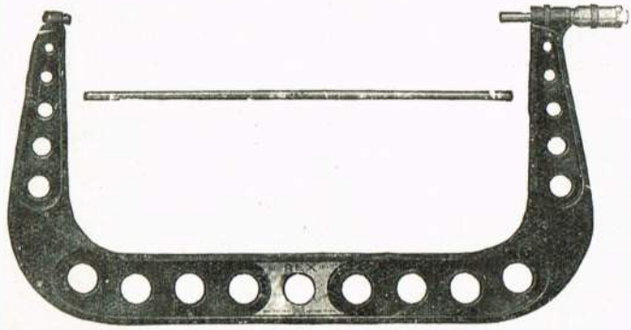
Rex Nos. 61 to 65.

Furnished with clamp ring.



Rex Nos. 67 to 76.

Furnished with clamp ring No. 71, and larger sizes are furnished in finished wooden cases.



Rex Nos. 77 to 88.

Furnished with clamp ring and in finished wooden case. Note that the frames have holes for lightness and also note the heavy type spindle and screw.

Fig. 405. MICROMETER CALIPER (No. 55).

Micrometer Caliper No. 55 is a precision tool especially designed for measuring pistons in motor service work. Its broad range of measurement from 2″ to 6″, by thousandths of an inch, covers all pistons ordinarily used.

This range of measurement is obtained by the four anvils furnished with the micrometer. These anvils are easily and quickly changed, and held positively in place by a knurled nut. One anvil is for measurements from 2″ to 3″, another from 3″ to 4″, and so on.

ENGLISH OR METRIC MEASURE.

Range 2″ to 6″ length, 6″ diam., or 50 m/m to 150 m/m, length. 150 m/m diam.

Price **£4 3 3**; with standards, **£5 10 6**; with ratchet stop, **£4 5 6**; with standards and ratchet stop, **£5 12 6.**

Fig. 406. REX MICROMETER CALIPERS Nos. 11 and 59 to 88.

ENGLISH OR METRIC MEASURE.

Range 0 to 24″ or 0 to 600 m/m.

The frames are of I-section to give the greatest rigidity and strength with lightness. A feature of the design is the shape of the frame which gives greater measuring capacity than frames of the circular type.

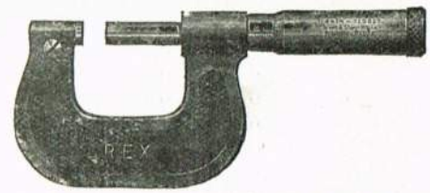
These micrometers are regularly furnished with a clamp ring which clamps the spindle and preserves the setting. The construction of the anvil, spindle, thimble and other parts is similar to the regular Brown & Sharpe micrometers, with means provided for adjustment for wear of both the measuring surfaces and screw. They are furnished for either English or Metric measure.

1″ MICROMETER CALIPER No. 11.

ENGLISH OR METRIC MEASURE.

Range 0 to 1 inch, or 0 to 25 m/m.

Price **£1 6 0.** With ratchet stop **£1 8 3.** Morocco case, **5/3.**



Micrometer Calipers, Nos. 59 to 88.

Tool No.	Range inches	Range m/m	Price without standards £ s. d.	Price with standards £ s. d.
59	0 to 1 or	0 to 25....	**1 8 3**	—
61	1 to 2 or	25 to 50	**1 11 3**	**1 15 6**
63	2 to 3 or	50 to 75	**1 14 6**	**1 19 6**
65	3 to 4 or	75 to 100	**1 17 6**	**2 3 9**
67	4 to 5 or	100 to 125	**2 0 9**	**2 8 0**
69	5 to 6 or	125 to 150	**2 3 9**	**2 12 0**
71	6 to 7 or	150 to 175	**2 8 0**	**2 17 3**
72	7 to 8 or	175 to 200	**2 12 0**	**3 2 6**
73	8 to 9 or	200 to 225	**2 16 3**	**3 7 9**
74	9 to 10 or	225 to 250	**3 0 3**	**3 13 0**
75	10 to 11 or	250 to 275	**3 4 6**	**3 18 3**
76	11 to 12 or	275 to 300	**3 8 9**	**4 3 3**
77	12 to 13 or	300 to 325	**3 13 0**	**4 8 6**
78	13 to 14 or	325 to 350	**3 17 0**	**4 15 0**
79	14 to 15 or	350 to 375	**4 1 3**	**5 0 0**
80	15 to 16 or	375 to 400	**4 9 6**	**5 9 6**
81	16 to 17 or	400 to 425	**4 18 0**	**5 18 9**
82	17 to 18 or	425 to 450	**5 6 3**	**6 8 3**
83	18 to 19 or	450 to 475	**5 14 6**	**6 17 6**
84	19 to 20 or	475 to 500	**6 7 0**	**7 13 3**
85	20 to 21 or	500 to 525	**6 19 6**	**8 8 9**
86	21 to 22 or	525 to 550	**7 12 0**	**9 4 6**
87	22 to 23 or	550 to 575	**8 4 6**	**10 0 0**
88	23 to 24 or	575 to 600	**8 17 0**	**10 15 9**

Micrometers Nos. 59 to 88 are furnished with clamp ring.

For ratchet stop add **2/-** to above prices.

Morocco cases can be furnished as follows: No. 59, **5/3**; No. 61, **10/6**, No. 63, **12/6**; No. 65, **14/6**; No. 67, **16/9**; No. 69, **19/9** each.

Nos. 71 to 88 are furnished in nicely finished wooden case.

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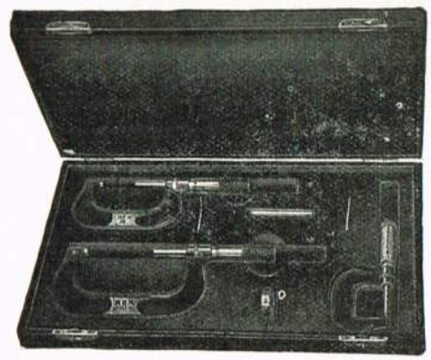
BROWN & SHARPE MICROMETERS.

The Rex Sets are accurate tools for inspecting the finished product as well as for general use. They are offered in several sets and the sets shown in this booklet have been selected as the most convenient and appropriate for ordinary requirements.



The tools are the Rex Micrometers listed on the preceding pages. The sets in cases insure accurate measurements at all times and protect the micrometers from dirt and grit.

This illustration shews **Set No. 133**.

Fig. 420.
REX SETS.

Micrometer Caliper Set No. 133.

3 calipers, measuring from 0 to 3″ or 0 to 75m/m.
Price, **£4 13 9.** With standards, **£5 3 3.** With ratchet stops, **£5. 0 0.** With standards and ratchet stops, **£5 9 6.** Leather case, **16/9** extra.

Micrometer Caliper Set No. 135.

6 calipers measuring from 0 to 6″ or 0 to 150 m/m.
Price **£10 15 9.** With standards **£12 7 0.** With ratchet stops, **£11 8 3.** With standards and ratchet stops, **£12 19 6.** Leather case, **£1 11 3** extra.

Micrometer Caliper Set No. 137.

6 calipers, measuring from 6″ to 12″ or 150 m/m to 300 m/m.
Price, **£18 15 0.** With standards, **£22 7 11.** With ratchet stops, **£19 7 6.** With standards and ratchet stops, **£22 19 6.** Price includes finished wooden case.

Micrometer Caliper Set No. 138.

12 calipers, measuring from 0 to 12″ or 0 to 300 m/m.
Price **£30 5 3.** With standards, **£35 8 3.** With ratchet stops, **£31 10 3.** With standards and ratchet stops, **£36 13 6.** Price includes finished wooden case.

Micrometer Caliper Set No. 139.

6 calipers, measuring from 12″ to 18″ or 300 m/m to 450 m/m.
Price, **£28 4 6.** With standards, **£33 19 2.** With ratchet stops, **£28 17 1.** With standards and ratchet stops, **£34 11 9.** Price includes finished wooden case.

Micrometer Caliper Set No. 140.

6 calipers, measuring from 18″ to 24″ or 450 m/m to 600 m/m.
Price, **£45 11 6.** With standards, **£54 15 9.** With ratchet stops, **£46 4 0.** With standards and ratchet stops, **£55 8 3.** Price includes finished wooden case.

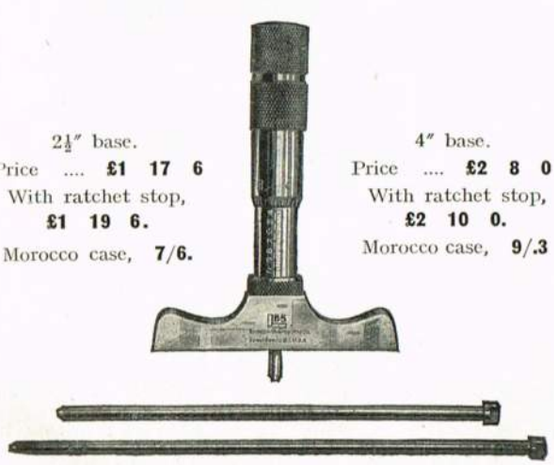
MICROMETER POCKET CASES,
Fig. 421 (Nos. 202 and 203).

No. 202 For Micrometers Nos. 8, 10, 15, 17, 19, 20, 21 and 22.
No. 203, For Micrometers Nos. 11, 12, 13 and 59.

These micrometer cases are light and handy and protect the micrometer from dirt and grit. They fit the pocket nicely, are not big and clumsy, and do not cause the pocket to bulge.

Each case is substantially made of steel with a strong spring cover, plush lined and covered with imitation leather.

Price .... **2/-** each.



$2\frac{1}{2}$″ base.
Price **£1 17 6**
With ratchet stop,
£1 19 6.
Morocco case, **7/6.**

4″ base.
Price **£2 8 0**
With ratchet stop,
£2 10 0.
Morocco case, **9/.3**

MICROMETER DEPTH GAUGE. Fig. 422 (No. 607).

ENGLISH OR METRIC MEASURE.

Range 0 to 3 inch.

Micrometer Depth Gauge No. 607 is offered to mechanics and toolmakers as a serviceable and dependable tool of a design which makes it at once practical and desirable.

The micrometer screw has a movement of 1″ and the range of 0 to 3″ is obtained by the use of the three measuring rods furnished. The rod desired is easily and simply inserted in the gauge through a hole in the micrometer screw.

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BROWN & SHARPE MICROMETERS.

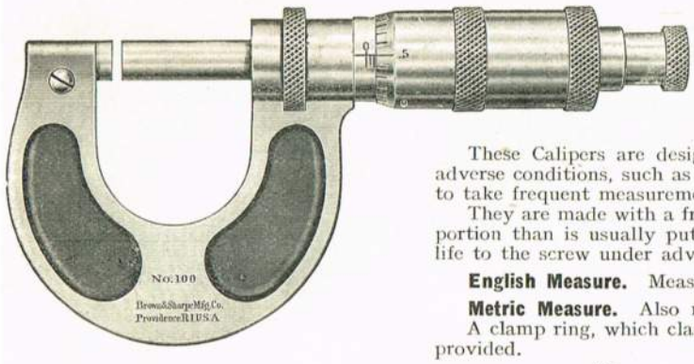


Fig. 425. Heavy Type Micrometers.

These Calipers are designed to meet the demands of constant and severe usage under adverse conditions, such as the dirt and moisture of grinding rooms or wherever it is desired to take frequent measurements with the clamp ring set.

They are made with a frame of heavy I section with a much heavier spindle and threaded portion than is usually put into calipers. This permits greater stiffness and insures longer life to the screw under adverse conditions because of larger bearing surface for the threads.

English Measure. Measure by thousandths of an inch.

Metric Measure. Also made to measure by hundredths of a millimetre.

A clamp ring, which clamps the spindle and preserves the setting, and a ratchet stop are provided.

No.	100	102	104
English	0″—1″	1″—2″	2″—3″
Metric	0—25m/m	25—50m/m	50—75m/m
Price	**£2 10 0**	**£2 15 3**	**£3 0 3**
With standard	—	**£3 1 6**	**£3 5 9**
Case	**9/6**	**10/6**	**12/6**

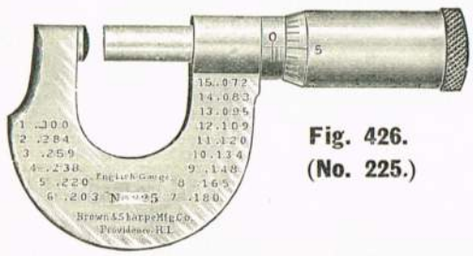


Fig. 426. (No. 225.)

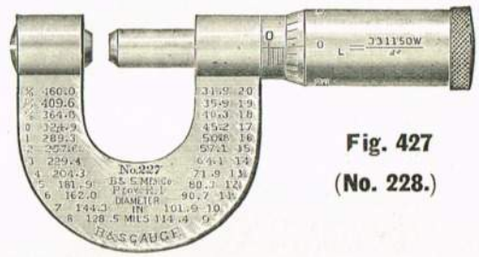


Fig. 427 (No. 228.)

No. 225 represents a caliper for measuring thickness of tubing, and is well adapted for use in boiler shops, etc. Capacity 0″—½″, **£1 13 3.** With ratchet stop, **£1 15 6.** Case **5/–.**

Graduated Metric—same price.

Arranged for users of wire for electrical purposes, this caliper measures all sizes to 0000, B. & S. Gauge, by 10ths of mils.

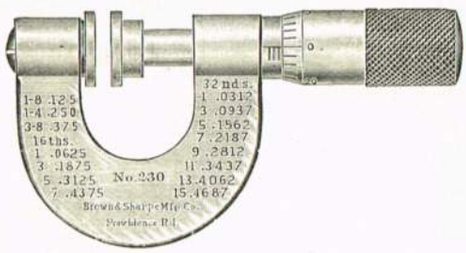
The equivalents expressed in mils, of the different sizes of wire from 0000 to 20, B. & S. gauge, are stamped on one side of the frame and the circular mils of the same size on the other.

Three formulas are stamped on the thimble : one for the weight, length in feet and diameter being known ; and one for resistance of commercial copper wire, in ohms per hundred feet at 75° F., length and diameter being known.

No. 228. Differs from Micrometer Caliper No. 227 only in that the equivalents stamped on one side of the frame are for wire from 21 to 44, B. & S. gauge, and the resistance of commercial copper wire, in ohms per hundred feet at 75° F., of the same sizes on the other.

Capacity 0—½″, **£1 19 7** ; with ratchet stop, **£2 1 8.** Case **4/2.**

Fig. 428. (No. 230.) Paper Gauge Micrometers.



In measuring the thickness of paper, sheet rubber or other yielding substances, the discs shown on the ends of the measuring spindle and adjusting screw are invaluable. The comparatively large sizes have less tendency to compress the objects measured and enable accurate measurements to be quickly obtained.

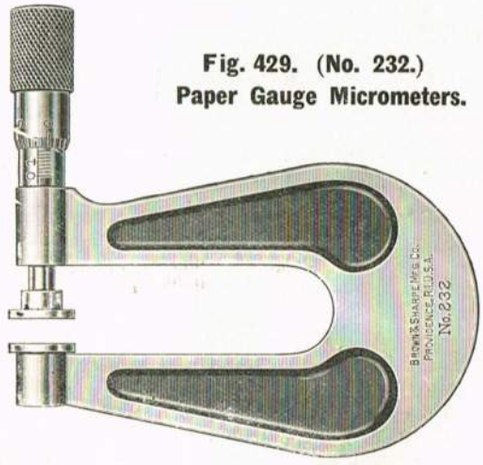
English Measure. Measures all sizes less than three-eighths of an inch by thousandths of an inch.

Metric Measure. Also made to measure all sizes less than nine millimetres by hundredths of a millimetre. When so made, the table of decimal equivalents is omitted.

Capacity 0—⅜″, **£1 19 7** ; with ratchet stop, **£2 1 8.** Case **5/–.**

Or graduated in metric, 0—9 m/m, same price.

Fig. 429. (No. 232.) Paper Gauge Micrometers.



The opening in the frame is 2″ deep, thus allowing the measurements to be taken at some distance from the edge of the paper.

The measuring spindle and adjusting screw are furnished with discs as shown.

English Measure. Measures all sizes less than three-eighths of an inch by thousandths of an inch.

Metric Measure. Also made to measure all sizes less than nine millimetres by hundredths of a millimetre.

Capacity 0—⅜″ or 0—9 m/m. Price **£2 12 0** ; with ratchet stop, **£2 14 3.** Case **10/6.**

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BROWN & SHARPE MICROMETERS.

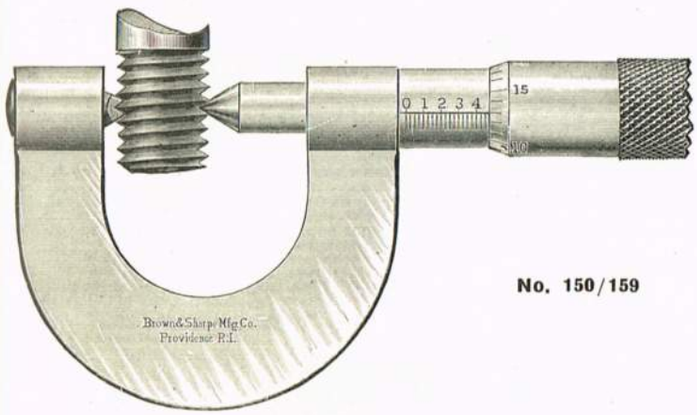
Fig. 430 (No. 233). Micrometer.

No. **233** Caliper is found of service to wire drawers, watchmakers and others who desire fine measurements and whose work is of such a class that a Micrometer Caliper can be used when placed on a bench. It is shown half-size.

ENGLISH MEASURE.—Measures all sizes less than one-half inch by *ten-thousandths* of an inch. The measurements can be read directly from the barrel. The screw has fifty threads and the barrel is divided into two hundred equal parts.

METRIC MEASURE.—Also made to measure all sizes less than thirteen millimetres by one two-hundredth of a millimetre.

Capacity, 0 to ½ in. Price, **£6 5 0.** Graduated in m/m. 0 to 13 m/m same price.



No. 150/159

The distinctive feature in the construction of this Caliper is that the end of the movable spindle is pointed, and the fixed end or " anvil " is V-shaped. Enough is taken from the end of the point and the bottom of the V is carried down low enough, so that they will not rest on the bottom or top of the thread to be measured, but on the cut surface. As the thread itself is measured, it will be seen that the actual outside diameter of the piece does not enter into consideration.

Brown & Sharpe's measure one-half of the depth of the thread from the top, on each side, the diameter of the thread as indicated by the Caliper, or the pitch diameter, is the full size of the thread less the depth of one thread.

The depth of thread can be found as follows :—

Depth of V. Thread	= ·886 ÷	number of threads to	1 inch.
,, U.S. ,,	= ·6495 ÷	,, ,,	1 inch.
,, Whitworth	= ·640 ÷	,, ,,	1 inch.

No.	Cap. In.	Range Per Inch	Form of Thread	Price	Price of Case
150	1-2	48 to 64 Thds.	V or U.S. Standard	£2 8 0	5 0
*152	1	8 to 13 Thds.	V, United States or Whitworth Standard	£2 10 0	5 3
153	1	14 to 20 Thds.		£2 10 0	5 3
154	1	22 to 30 Thds.		£2 10 0	5 3
155	1	32 to 40 Thds.		£2 10 0	5 3
156	2	4 1-2 to 7 Thds.		£3 0 3	6 9
*157	2	8 to 13 Thds.		£3 0 3	6 9
158	2	14 to 20 Thds.		£3 0 3	6 9
159	2	22 to 30 Thds.		£3 0 3	6 9

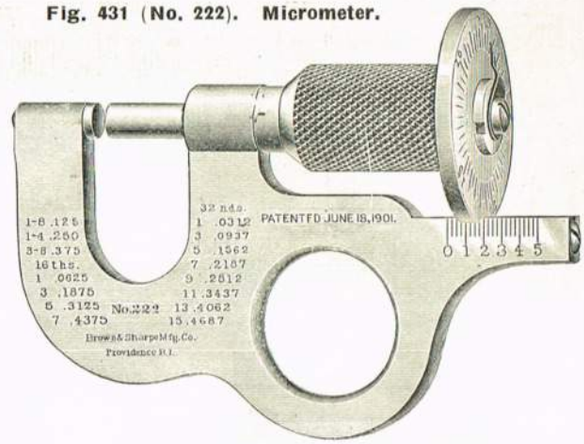
*Whitworth Standard range 8 to 12 threads per inch only.

A Standard is furnished for adjusting the 2″ Micrometers.

Metric Measure. Also furnished in corresponding metric sizes for V, United States, or Whitworth Standard Threads.

Each of the above packed one in a box.

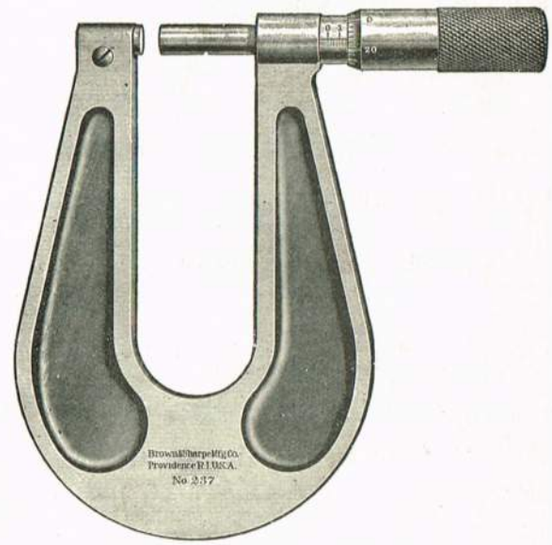
Fig. 431 (No. 222). Micrometer.



This English Micrometer is specially suitable for sheet metal workers, measures all sizes less than one-half of an inch by one-half thousandths of an inch, and one-quarter thousandths are readily estimated.

Capacity .... 0 – ½ in. Price £**1 17 6.** Case **10/6.**
Graduated in Metric 0 – 13 m/m. Same price.

Fig. 433 (No. 237/9). Rolling Mill Caliper.



Designed for sheet metal worker's use, this Caliper is also adapted for a wide range of other uses requiring a caliper of unusual depth. The opening in the frame is about 3 in. deep, a feature much appreciated, as it enables sheet metal to be more accurately measured than would be possible with an ordinary Micrometer.

ENGLISH MEASURE.—Measures all sizes less than one inch by thousandths of an inch.

METRIC MEASURE.—Also made to measure all sizes less than twenty-five millimetres by hundredths of a millimetre. No. **237**, Capacity, 0–1 in. Price, £**2 12 0**, with Ratchet Stop, £**2 14 3**, case, **10/6**. Graduated Metric 0–25 m/m. same price.

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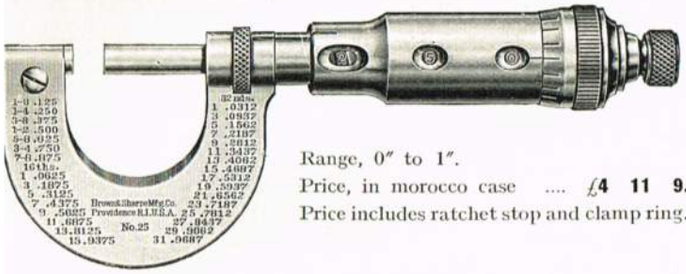
MICROMETERS

Fig. 437.

Direct Reading Micrometer Caliper (No. 25).

Patented August 22nd, 1911 ; May 5th, 1914.



Range, 0″ to 1″.

Price, in morocco case .... £**4 11 9.**

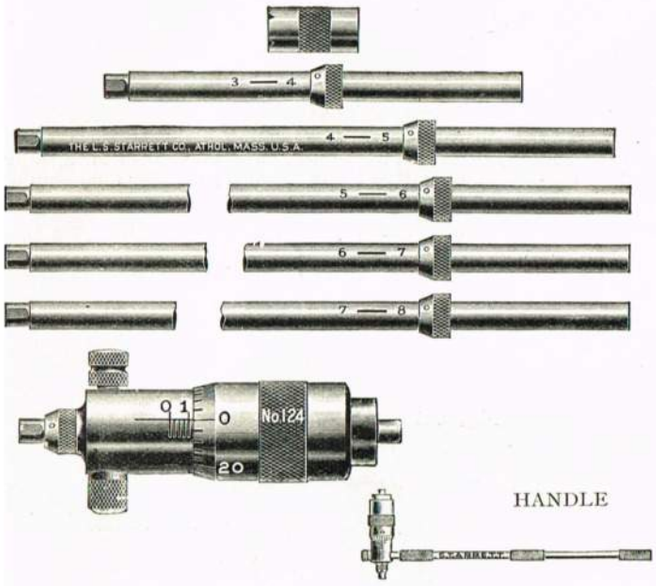
Price includes ratchet stop and clamp ring.

This Micrometer Caliper presents an entirely new feature in that thousandths of an inch can be read in exact figures, without the necessity of calculation with the aid of graduation lines. The mechanical principle of a screw free to move in a fixed nut, used in our regular line of micrometer calipers, and with which mechanics are familiar, is retained.

The figures showing in the opening nearest the frame indicate the movement of the spindle by tenths of an inch. Those in the next opening register the movement by hundredths of an inch, while the figures in the last opening indicate the movement by thousandths. In addition the thimble on the end of the sleeve is graduated in connection with a line on the sleeve to read to thousandths of an inch. By means of these lines, fractional parts of a thousandth may be estimated.

The registering mechanism is so constructed that the dials are positively locked, and the micrometer cannot get out of adjustment and read incorrectly.

Parts not subject to wear or stress are made of an alloy to eliminate weight. All other parts are made of steel, the spindle and anvil being hardened. The caliper may be adjusted to compensate for wear the same as on our regular line of micrometer calipers.



INSIDE MICROMETERS. Fig. 438 (No. 124).

The micrometer screw in the head has ½ in. movement in Sets A and B, 1 in. in Set C, and, by means of the extension rods furnished, the sizes as given below for each set can be obtained. The extension rods are provided with a collar, against which the rods are conveniently and accurately set in the micrometer head. In setting these rods see that the zero mark on the collar coincides with the zero mark on the micrometer head. With the rods are sent standard gauges or rings to slip on the rods under the collars, to further extend the rod. The contact surfaces are all hardened, and provision is made for adjustment, to compensate for wear of the screw and contact surfaces.

The auxiliary handle, as shown in cut, can be used with sets A, B and D. The handle is used by removing the nut opposite the lock nut and screwing the handle in the place of same, thus fitting the tool for use in places too small for the hand. Handle is **4/3** extra.

Set.	Comprising	Price.
A.	6 rods and 1—½″ gauge, capacity 2″—8″, with case	**£1 10 3**
B.	10 ,, 2″—12″ ,, ,, ...	**£1 15 6**
C.	4 rods and 1—1″ gauge and 2—2″ gauge, capacity 8″—12″, with case	**£2 2 9**
D.	Combined Sets A and C, capacity 2″—32″	**£3 13 0**

The above sets can be supplied **graduated millimetres** at same price. Cases—A, **7/3** ; B, **8/6**; C, **16/9**; £**1 0 9** each.

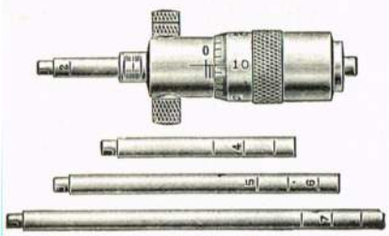


Fig. 439 (No. 120. Set A).

Set A has screw and nut the same as No. 3 Micrometer Caliper, and reads in thousandths, measures from 2″ to 8″, has ½″ movement of screw, and requires four extension rods. The rods are provided with a hardened steel adjustable anvil in ends, which permits adjusting for wear. A small binding screw locks rods when set. Rods are marked in ½″ divisions and set to a similar line on a projection of the barrel.

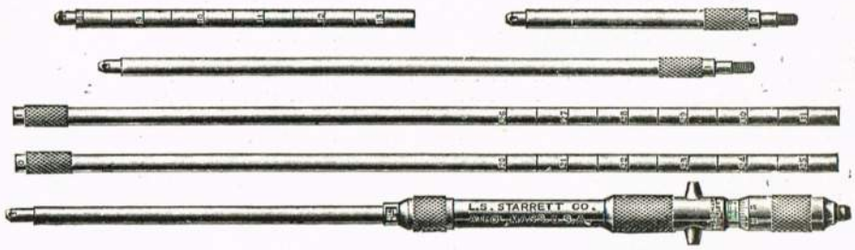


Fig. 439A (No. 120. Set C).

Set C is similar in all respects with the exception that it measures from 8″ to 32″, with four extension rods and has a lock for the rods ; and has 1″ movement of the screw. This is a very strong and serviceable tool, as well as an accurate one. We can furnish rods of extra lengths for these tools when desired.

When so ordered an auxiliary handle accompanies Sets A, B and D, which is used by removing the nut opposite the lock-nut and screwing the handle in place of same, thereby enabling one to take measurements in holes and other places where the micrometer could not otherwise be used.

Set A.	Comprising	4 rods.	Capacity	2″—8″ in 1/1000″.	....	Price	**£1 8 6**	.... With Case **£1 15 6** each.
Set B.	,,	7 ,,	,,	2″—12″ in 1/1000 .	....	,,	**£1 11 6**	.... ,, **2 2 9** each.
Set C.	,,	4 ,,	,,	8″—32″ in 1/1000″.	....	,,	**£1 18 9**	.... ,, **15 3** ,,
Set D.	,,	Sets A and D combined		....	....	,,	**£3 6 9**	.... ,, **6** ,,

Handle, **4/3** each (See Fig. 124). Extra rods, 3d. per inch.

Fig. 440 (No. 129M). Same as above, but graduated in millimetres.

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BROWN & SHARPE MICROMETERS.

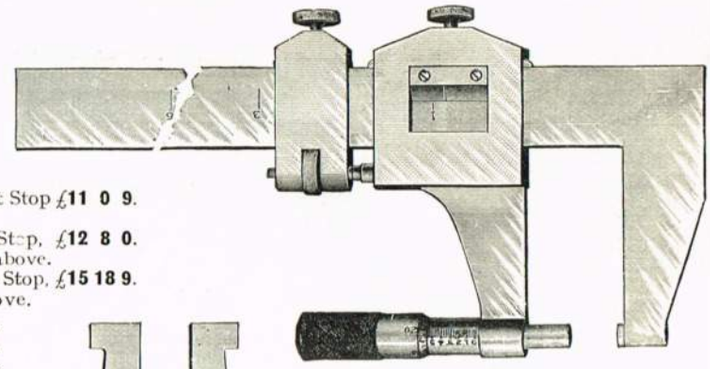
Fig. 441. Micrometer Caliper (No. 245/8.)

The slide can be set accurately by means of the graduated lines on the bar.

Measurements are obtained by means of a micrometer screw.

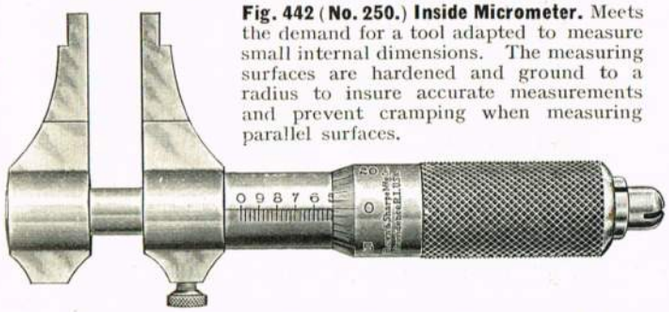
ENGLISH MEASURE.—Measures all sizes less than 6 in. in length and 4 in. in diameter, by thousandths of an inch.

METRIC MEASURE.—Also made to measure all sizes less than 150 millimetres in length and 100 millimetres in diameter by hundredths of a m/m.



No. **245**, Capacity 0–6 in., 4 in. dia. Price £**10 18 9**, with Ratchet Stop £**11 0 9**.
Graduated Metric 0–150 m/m., 100 m/m. dia., same price.
No. **246**, Capacity 0–12 in., 6 in. dia. Price, £**12 5 9**, with Ratchet Stop, £**12 8 0**.
Graduated Metric 0–300 m/m., 150 m/m. dia., same price as above.
No. **248**, Capacity 0–24 in., 6 in. dia. Price, £**15 16 9**, with Ratchet Stop, £**15 18 9**.
Graduated Metric 0–600 m/m., 150 m/m. dia., same price as above.

Fig. 442 (No. 250.) Inside Micrometer. Meets the demand for a tool adapted to measure small internal dimensions. The measuring surfaces are hardened and ground to a radius to insure accurate measurements and prevent cramping when measuring parallel surfaces.



No. **250**, Capacity, ·200 in.–1 in. Price, £**2 18 3**, case, **5/3**.
Graduated Metric, 5–25 m/m. same price as above.

No. **252** and No. **254**.—Very similar to No. **250**, but has different shape of jaws permitting inside measurements over a flange or shoulder.

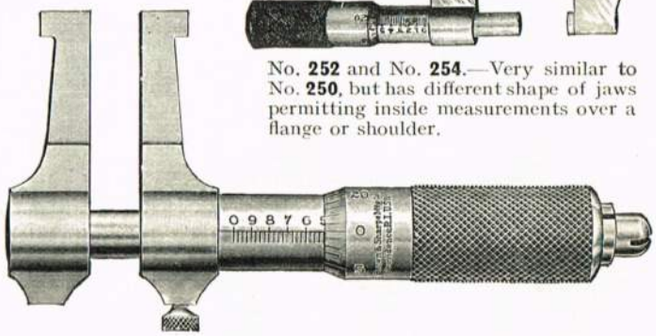
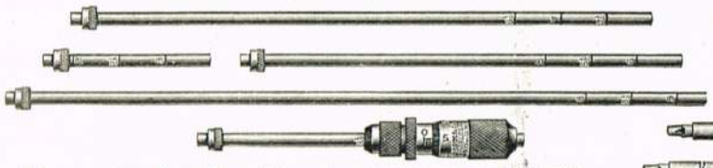


Fig. 443 (No. 252). Capacity, ½ in. – 1½ in. Price, £**3 2 6**, case, **5/3**.
Graduated Metric 12–37 m/m, same price as above.

Fig.443 (No. 254). Capacity 1 in. – 2 in. Price, £**3 2 6**, case, **6/9**.
A graduated Metric 25–50 m/m., same price as above.

Fig. 444. Inside Micrometers (Nos. 260/1).



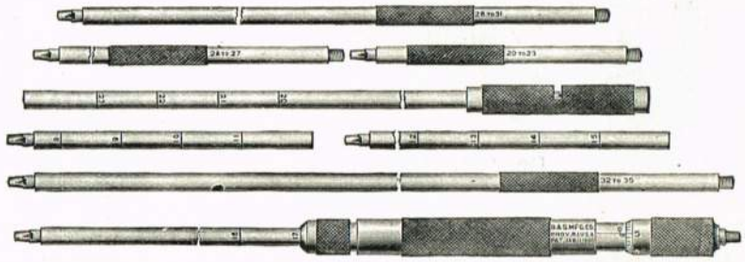
These consist of a holder with a micrometer screw and thimble. The extension rods are graduated by a series of angular grooves of a form and depth that allow the clamping fingers to spring in and the adjustments to be quickly and positively made.

ENGLISH MEASURE.—Measure by thousandths of an inch.

METRIC MEASURE.—Also made to measure by hundredths of a millimetre.

No.	No. of Rods.	Range.	Price without Case. £ s. d.	Price with Case. £ s. d.
260	.... 5	2 in. to 9 1-2 in.	.... **1 17 6**	.... **2 4 9**
	6	50 m/m. to 230 m/m.	.... **1 17 6**	.... **2 4 9**
261	.... 7	2 in. to 12 1-2 in.	.... **2 3 9**	.... **2 15 3**
	.... 8	50 m/m. to 290 m/m.	.... **2 3 9**	.... **2 15 3**

Fig. 445. Inside Micrometers (No. 262).



These consist of a holder with a micrometer screw and thimble. The extension rods are graduated by a series of angular grooves of a form and depth that allow the clamping fingers to spring in and the adjustments to be quickly and positively made.

ENGLISH MEASURE.—Measure by thousandths of an inch.

METRIC MEASURE.—Also made to measure by hundredths of a millimetre.

No.	No. of Rods.	Range.	Price without Case. £ s. d.	Price with Case. £ s. d.
262	.... 8	8 in. to 36 in.	.... **3 2 6**	.... **4 3 3**
	8	200 m/m. to 900 m/m.	.... **3 2 6**	.... **4 3 3**

Fig. 446. Tubular Inside Micrometers (No. 270).

The Tubular Inside Micrometers are made of tubing, which renders them very light and convenient to handle, especially those of the longer lengths.

Fitted at one end with a micrometer head, with a ½ in. or 1 in. movement. The measurement points are hardened, and the faces are ground on a radius. Fibre grips are provided to prevent inaccuracies due to heat of hand. A clamp screw is provided.

Range.

Range, Inches.	Price.	Range, inches.	Price.
2 to 2 1-2	£**1 5 0** each.	5 to 6	£**1 7 0** each.
2 1-2 to 3		6 to 7	
3 to 3 1-2		7 to 8	
3 1-2 to 4		8 to 9	
4 to 4 1-2		9 to 10	£**1 9 3** each.
4 1-2 to 5		10 to 11	
		11 to 12	

Graduated in Metric, same price as above.

Fig. 447. Micrometer Heads.

No. **290.** Capacity 0–½ in. in one-thousandth in. Price, with or without Ratchet Stop, **18/9**.
No. **291.** Capacity 0–½ in. in one-ten-thousandth in. Price, with or without Ratchet Stop, £**1 6 0**.
No. **294.** Capacity 0–1 in. in one-thousandth. Price, with or without Ratchet Stop £**1 3 0**.
No. **295.** Capacity 0–1 in. in one-ten-thousandth. Price, with or without Ratchet Stop, £**1 10 3**.
No. **294/5** can be furnished with Clamp Screws at above prices.
Graduated in Metric, same prices as above.

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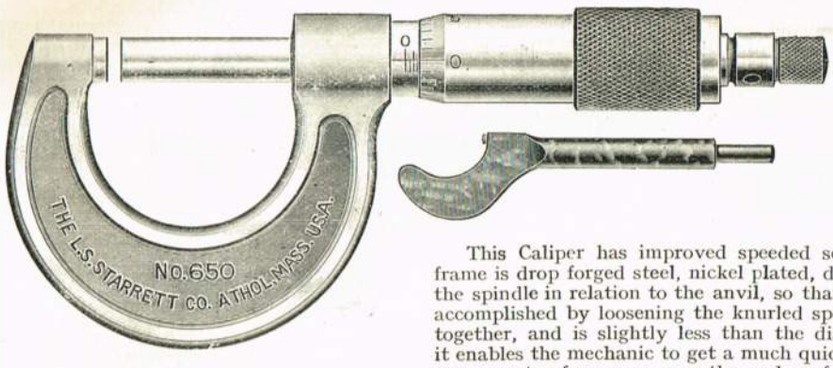


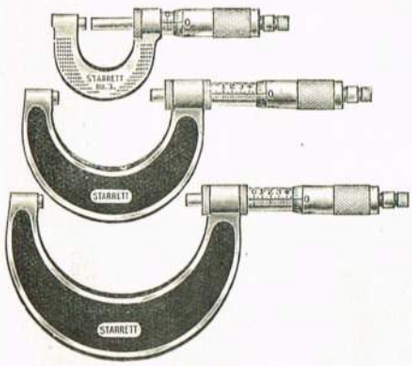
Fig. 450 (No. 650.)
The "Yankee" 1 in. Micrometer.

Capacity .... 1/1,000 in. to 1 in.

This Caliper has improved speeded screw for adjusting to compensate for wear. The frame is drop forged steel, nickel plated, dull finish. A new feature is provided for adjusting the spindle in relation to the anvil, so that the reading of the micrometer will be correct and accomplished by loosening the knurled speeder which serves to bind the screw and thimble together, and is slightly less than the diameter of the screw, but when turning the screw it enables the mechanic to get a much quicker adjustment than when using the thimble. This compensates for wear: see the end surfaces of anvil and spindle are free from dirt, then close the spindle against the anvil. Loosen the knurled speeder and revolve thimble until the reading lines coincide, then screw up speeder tightly—this will lock thimble and screw firmly.

Prices, without ratchet stop, £**1 11**s. **3**d.; case, **5**s. **3**d.
Price with ratchet stop, £**1 13**s. **6**d.; case, **5**s. **3**d.

No. **650M**. Same design and prices as the No. **650**, only reading 1/100 m/m to 25 m/m.



No. 226.

Fig. 451 (No. 226).

These calipers meet the demand for accurate gauges at a low price. They are better adapted for general use than the Vernier or bar micrometer, as they can be set quickly for the different measurements and are more easily read.

Each caliper is graduated to read by thousandths of an inch, is furnished with lock nut, and is sent with or without ratchet stop as desired.

The frames are drop forged from bar steel and are nicely finished.

The 1 in. has the decimal equivalents stamped on the frame. The other sizes are marked to show their capacity.

Standards for use in adjusting these calipers will be furnished when desired at prices given below.

Size	Capacity.	Without Ratchet Stop.	With Ratchet Stop.	Case extra.	Standard extra.	To read 1/10,000 in. extra.
1	In 1/1,000″, 0″–1″	£1 19 9	£2 1 9	5/3	—	7/6
2	In 1/1,000″, 1″–2″	1 15 6	1 17 6	10/6	4/3	7/6
3	In 1/1,000″, 2″–3″	2 2 0	2 4 0	12/6	5/3	7/6
4	In 1/1,000″, 3″–4″	2 5 0	2 7 0	14/9	6/3	7/6
5	In 1/1,000″, 4″–5″	2 10 0	2 12 3	16/9	7/6	—
6	In 1/1,000″, 5″–6″	2 14 3	2 16 3	20/–	8/6	—

Fig. 452 (No. 226).
Cases for Micrometers.

Covered in morocco leather and lined velvet.

For	Price each
1″ or 25m/m	5/3
2″ or 50m/m	10/6
3″ or 75m/m	12/6
4″ or 100m/m	14/9
5″ or 125m/m	16/9
6″ or 150m/m	20/–
Sets of 3	22/–
Sets of 6	25/–

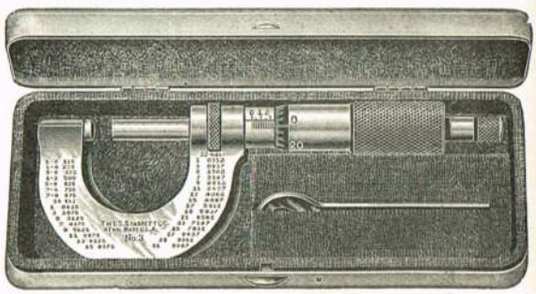


Fig. 453 (No. 910).
Nickel-plated Micrometer Case.

For 1″ size only. Lined black velvet. 13/16″ thick, 2¼″×5½″, weight 7 ozs.

Price .... **5/3.**

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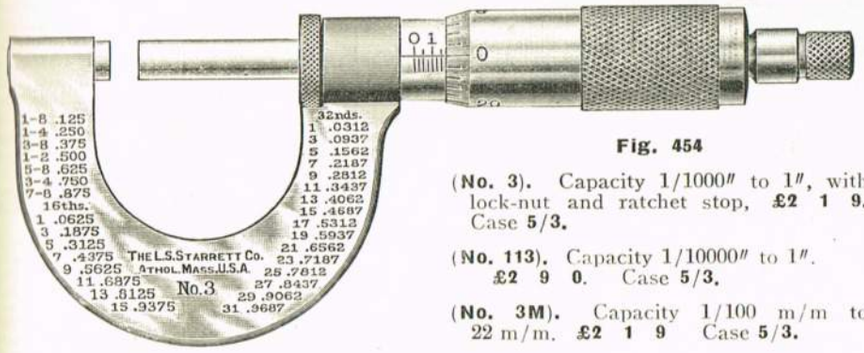

Fig. 454

(**No. 3**). Capacity 1/1000″ to 1″, with lock-nut and ratchet stop, **£2 1 9.** Case **5/3.**

(**No. 113**). Capacity 1/10000″ to 1″. **£2 9 0.** Case **5/3.**

(**No. 3M**). Capacity 1/100 m/m to 22 m/m. **£2 1 9** Case **5/3.**

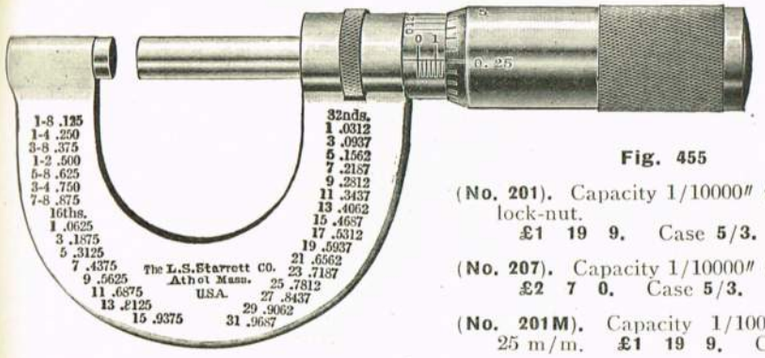

Fig. 455

(**No. 201**). Capacity 1/10000″ to 1″, with lock-nut.
£1 19 9. Case **5/3.**

(**No. 207**). Capacity 1/10000″ to 1″.
£2 7 0. Case **5/3.**

(**No. 201M**). Capacity 1/100 m/m to 25 m/m. **£1 19 9.** Case **5/3.**

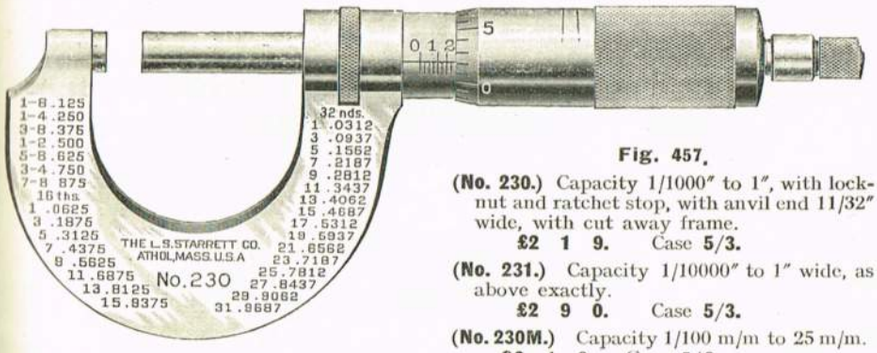

Fig. 457.

(**No. 230.**) Capacity 1/1000″ to 1″, with lock-nut and ratchet stop, with anvil end 11/32″ wide, with cut away frame.
£2 1 9. Case **5/3.**

(**No. 231.**) Capacity 1/10000″ to 1″ wide, as above exactly.
£2 9 0. Case **5/3.**

(**No. 230M.**) Capacity 1/100 m/m to 25 m/m.
£2 1 9. Case **5/3.**

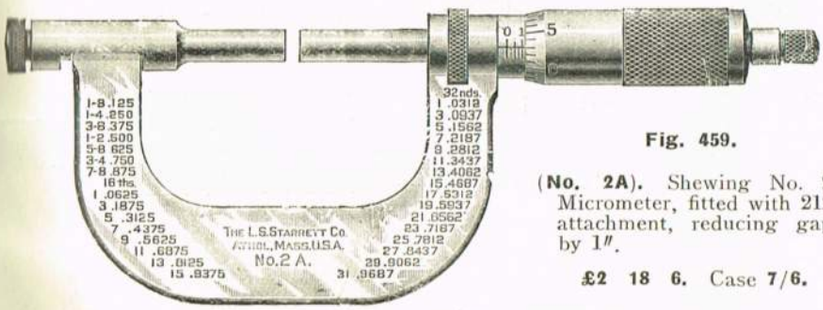

Fig. 459.

(**No. 2A**). Shewing No. 2 Micrometer, fitted with 212 attachment, reducing gap by 1″.

£2 18 6. Case **7/6.**

M after a number denotes millimetre sizes.

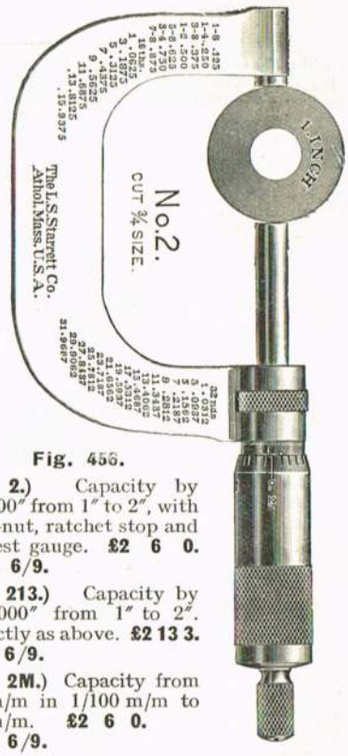

Fig. 456.

(**No. 2.**) Capacity by 1/1000″ from 1″ to 2″, with lock-nut, ratchet stop and 1″ test gauge. **£2 6 0.** Case **6/9.**

(**No. 213.**) Capacity by 1/10000″ from 1″ to 2″. Exactly as above. **£2 13 3.** Case **6/9.**

(**No. 2M.**) Capacity from 25 m/m in 1/100 m/m to 50 m/m. **£2 6 0.** Case **6/9.**

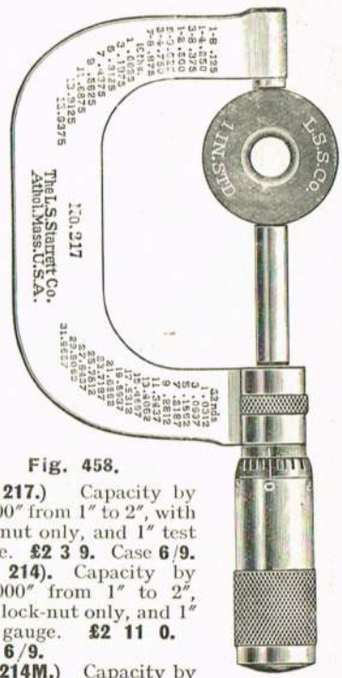

Fig. 458.

(**No. 217.**) Capacity by 1/1000″ from 1″ to 2″, with lock nut only, and 1″ test gauge. **£2 3 9.** Case **6/9.**

(**No. 214.**) Capacity by 1/10000″ from 1″ to 2″, with lock-nut only, and 1″ test gauge. **£2 11 0.** Case **6/9.**

(**No. 214M.**) Capacity by 1/100 m/m from 25 m/m to 50 m/m. **£2 3 5.** Case **6/9.**

Fig. 459A.

(**No. 212**). This attachment (see Fig. 459, No. 2A, fitted with end attachment), by means of which a 2″ micrometer may be instantly converted into a 1″ tool, will be furnished, when ordered, with any 2″ or 50 m/m micrometers. It will not fit No. 226 micrometer. Price **12/6.**

(**No. 212M**). As above.

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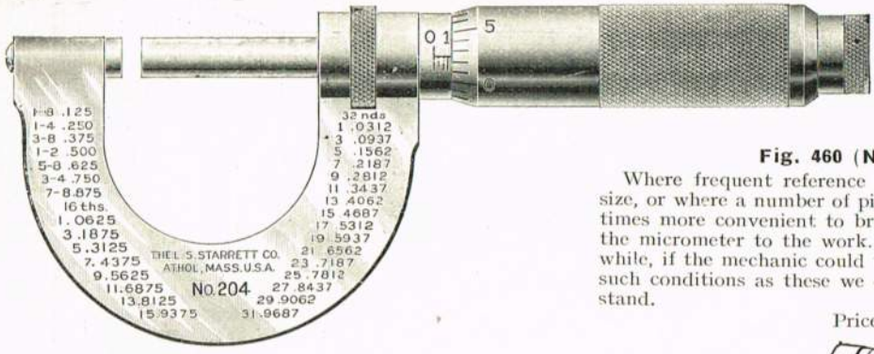

Fig. 461 (No. 204). Capacity 1/1000″ to 1″. **The New Quick Adjustment Micrometer,** with ratchet stop & lock-nut. By pressing the thumb plunger this disengages the nut from the screw, which immediately releases the nut, giving quick adjustment without impairing its efficiency in any way.

Price **£3 2 6.** Case **6/9.**

No. 204M. As above. Capacity 1/100 m/m to 25 m/m.

Price **£3 2 6.** Case **6/9.**

Fig. 460 (No. 206). Micrometer Stand.

Where frequent reference is to be made to a caliper that is set at a given size, or where a number of pieces must be made of the same size, it is sometimes more convenient to bring the work to the micrometer than to bring the micrometer to the work. The use of a caliper also occupies one hand, while, if the mechanic could use both hands he could work faster. To meet such conditions as these we offer the Starrett improved micrometer caliper stand.

Price ... **12/6** each.

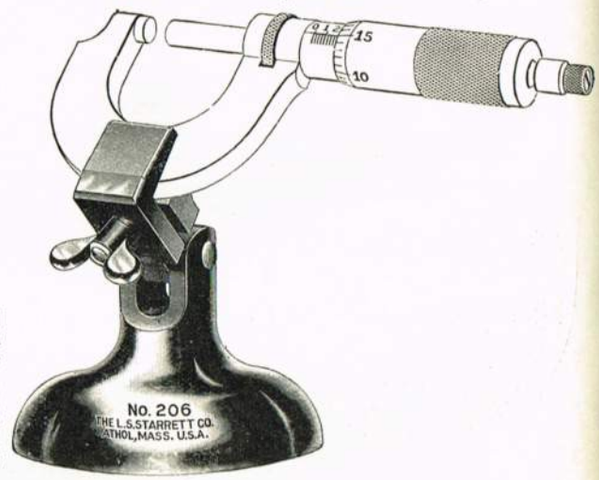

Fig. 462 (No. 127). Micrometer.

The frames are cut from steel plates, nicely finished. The sides are covered with hard rubber, put on with brass screws, preventing inaccuracy through expansion caused by change in temperature when held in the hands. The micrometer screw adjusts 1″, reading 1/1000″, and is provided with lock nut. The different length tail spindles, forming anvils, are interchangeable, and have positive stops to set against their socketed seats. The adjusting collars on these anvils have notches to facilitate the removal of dirt, which would prevent them from setting accurately against the seat. The contact ends of spindles are slightly convex. Furnished with ratchet stop.

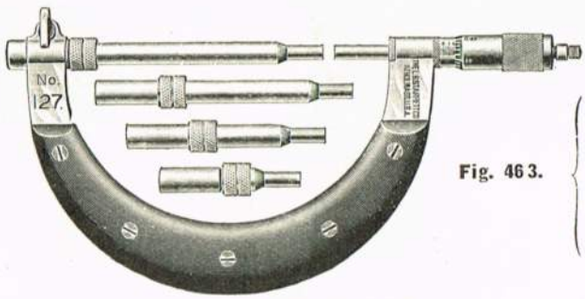

Fig. 463.

	English.				Metric.		
No.					No.		
127A.	0 to 4 ins.	**£8**	**19**	**6**	**127MA.**	0 to 100 m/m	**£8 19 6**
127B.	4 to 8 ins.	**£11**	**17**	**6**	**127MB.**	100 to 200 m/m	**£11 17 6**
127C.	8 to 12 ins.	**£15**	**16**	**9**	**127MC.**	200 to 300 m/m	**£15 16 9**
127D	12 to 16 ins.	**£22**	**18**	**6**	**127MD.**	300 to 400 m/m	**£22 18 6**
127E	16 to 20 ins.	**£23**	**3**	**6**	**127ME.**	400 to 560 m/m	**£25 3 6**
127F.	20 to 24 ins.	**£35**	**8**	**6**	**127MF.**	500 to 600 m/m	**£35 8 6**

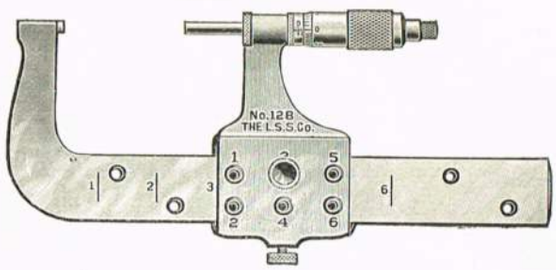

Fig. 464 (No. 128).

(No. 126.) 6″ Micrometer Calipers, will measure round work 4¼″, and flat work to 6″. Weight 21 ozs. Is rigid and accurate. Can be set quickly to exact position by inserting a plug. The six independent holes are bushed with hardened steel bushings, ground and lapped to fit the plug, which exactly locates the various settings. Fitted with ratchet and lock.

Price **£10 8 6.** Case **13/6.**

(No. 128M.) As above. Capacity 1/100 m/m to 15 c/m. Holes are set 25 m/m apart. Price **£10 8 6.** Case **13/6.**

Fig. 465.

No. 463. Full size engraving **Micrometer Head.** Capacity 1″, graduated 1/100″. Without lock-nut. With or without ratchet stop. **18/9** each.

No. 464. As above, but graduated 1/10080″. Price **£1 6 3.**

No. 463M. As No. 463, but graduated 1/100 m/m to 13 m/m. Price **18/9.**

Fig. 466.

No. 263. Full size engraving **Micrometer Head.** Capacity 1″, Graduated 1/10000″. With or without ratchet stop and lock-nut. **£1 3 0** each.

No. 363. As above, but graduated 1/10000″. Price **£1 10 3.**

No. 263M. As No. 263, but graduated 1/100 to 26 m/m. Price **£1 3 0.**

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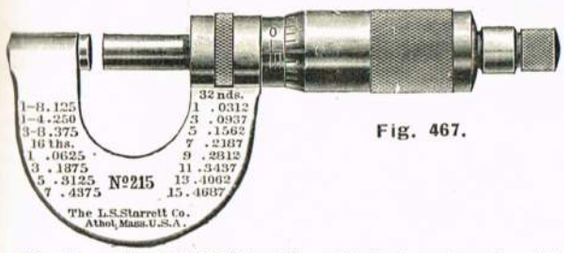


Fig. 467.

No. 215. Capacity 1/1,000″ to ½″, with lock nut and ratchet stop, **£1/15/6**; case **5/-**.

No. 219. As above, but capacity 1/10,000″ to ½″, **£2/2/9**; case **5/-**.

No. 215m. Capacity 1/100 m/m to 13 m/m., **£1/15/6**; case **5/-**.

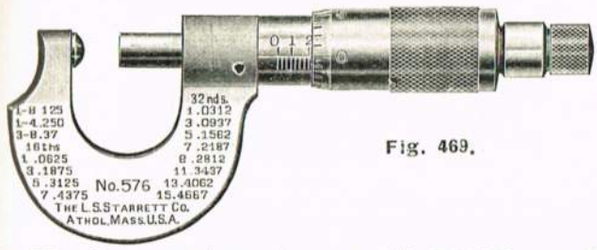


Fig. 469.

No. 576. For measuring tubing up to ½″, **£1/15/6**; case **5/-**.

No. 576m. For measuring tubing up to 13 m/m., **£1/15/6**; case **5/-**.

Without ratchet stop, **2/3 less.**

This caliper has no lock nut and has the face of the anvil rounded, which adapts it for accurately measuring the thickness of tubing, etc. The anvil touches at only one point on the inside, while the end of spindle, being flat, touches at only one point on the outside, thus measuring accurately the thickness of tubing. It will enter a ⅜ inch hole freely.

For measurements by thousandths up to one-half inch with decimal equivalents stamped on the frame, with ratchet stop.

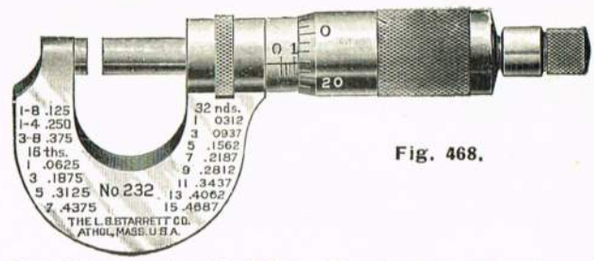


Fig. 468.

No. 232. Capacity 1/1,000″ to ½″, with lock nut and ratchet stop, anvil end, 9/32″, and cut away frame, **£1/15/6**; case **5/-**

No. 233. As above, but capacity 1/10,000″ to ½″, **£2/2/9**; case **5/-**.

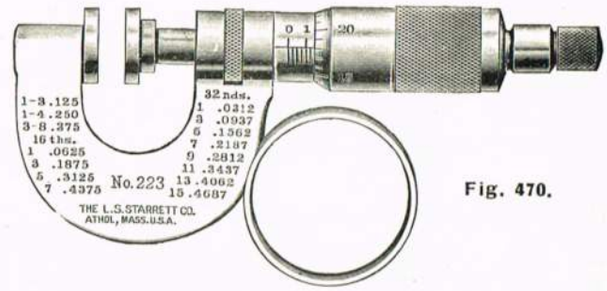


Fig. 470.

No. 223. For measuring paper, cardboard, rubber, etc. Capacity 1/1,000″ to 11/32″.

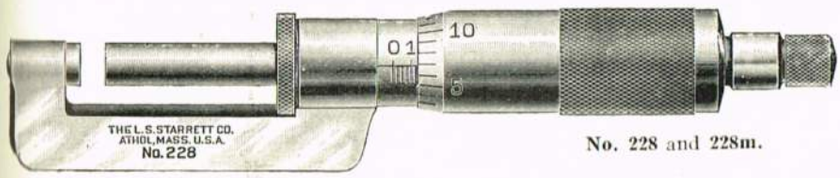
Without Ratchet Stop, but with ring, **£2/3/9**; case **5/-**.

With Ratchet Stop, and with ring, **£2/6/0**; case **5/-**.

No. 223m. As above, but capacity 1/100 m. to 8½ m/m. Same prices as above.

No. 225. Same as 223, but without ring attachment. **4/-** less above prices.

No. 225m. Same as 225. **4/-** less above prices.



No. 228 and 228m.

Fig. 471 (No. 228) Hub Caliper.

Used in the manufacture of cutters, where exact hub thickness is required. The frame will pass through a ¾″ hole. Capacity, 1/1,000″ to 1″. **£2/1/9**; case **5/3.**

No. 228m. As above, capacity, 1/100 m/m to 25 m/m. **£2/1/9**; case **5/3.**

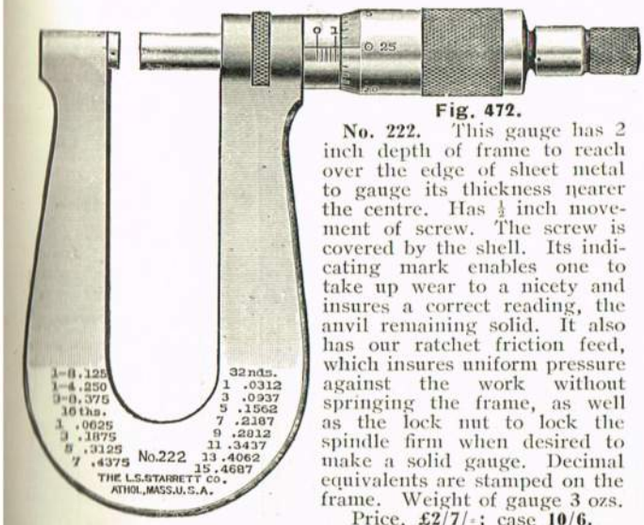


Fig. 472.

No. 222. This gauge has 2 inch depth of frame to reach over the edge of sheet metal to gauge its thickness nearer the centre. Has ½ inch movement of screw. The screw is covered by the shell. Its indicating mark enables one to take up wear to a nicety and insures a correct reading, the anvil remaining solid. It also has our ratchet friction feed, which insures uniform pressure against the work without springing the frame, as well as the lock nut to lock the spindle firm when desired to make a solid gauge. Decimal equivalents are stamped on the frame. Weight of gauge 3 ozs.

Price, **£2/7/-**; case **10/6.**

With depth of frame. Price, **£3/0/6**; case **10/6.**

No. 222m. As above, capacity 1/100 m/m. to 13 m/m.

Price, **£2/7/-**; case **10/6.**

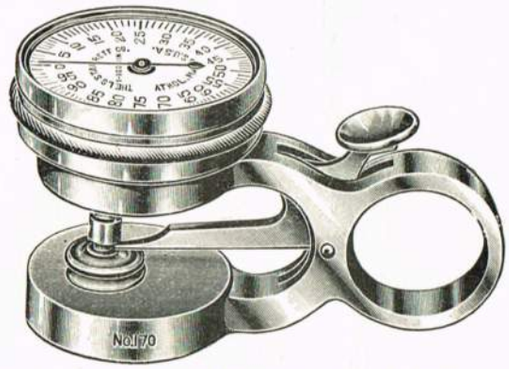


Fig. 473 (No. 170.) Dial Sheet Guage.

Capacity 0 to .150 by thousandths, nickle plated, used for determining quickly and accurately the thickness of paper. Steel, celluloid, leather, etc. Simple movement actuated by pressing the thumb pad, thus operating the dial spindle. By turning the knurled rim, the dial may be instantly moved to bring the hand to 0. The dial is figured 0, 5, 10, 15, etc., one revolution being 100 thousandths of one inch. The gauge is about 1⅜ inches high, 1½ inches in diameter and 3 inches long. Weight, 4½ ounces.

Price, **£3/2/6**; case **8/6.**

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STARRETT MICROMETERS.

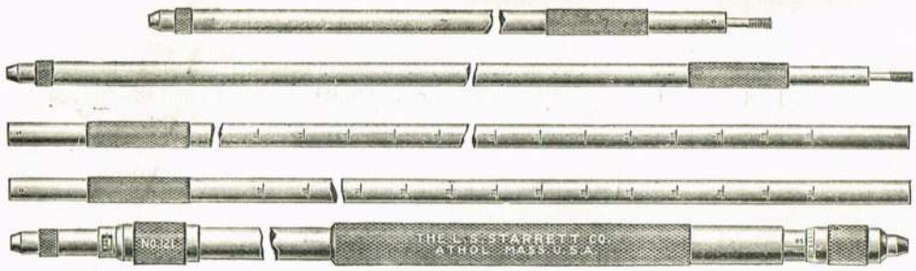


Fig. 474 (No. 121.) A, B, C. Packed in box.

Set A.	Comprising Stock with	1 rod,	capacity	32″—57″	....	....	Price	**£8**	**1**	**0**
Set B	,, ,,	2 ,,	,,	32″—82″	....	....	,,	**£9**	**10**	**9**
Set C.	,, ,,	3 ,,	,,	32″—107″	....	....	,,	**£11**	**15**	**6**

No. **120 M** is graduated in *millimetres* at the same price as above.

When linear measurements are beyond the capacity of the ordinary micrometer it is frequently necessary to have a more accurate instrument than the rule or steel tape. The inside calipers shown here were designed for and are now used by the Government in navy yards and arsenals. They consist of steel tubes with telescoping extensions combined with a 1″ screw micrometer movement. The tubes are accurately graduated and figured in inches and set to the inch marks showing the length wanted, and are firmly held by a knurled locking nut. The ends of the rods have hardened steel anvils. Combinations are possible which give a range from 32″ to 107″ and with micrometer accuracy over the whole range. These inside micrometer calipers are nickel plated. A case is furnished with each set.

Adjustable Caliper Gauges. Fig. 475. (No. 125)

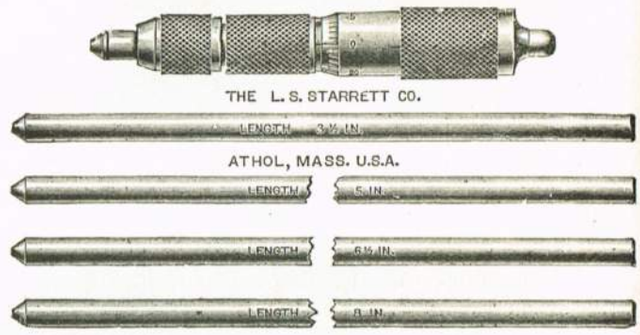
Designed for internal measurements of large cylinders and of distances between uprights. The body of the tool is a steel tube provided with a binding chuck on each of its ends. Into one end is clamped a plain rod, so that, when the chuck is loosened, it can be quickly adjusted to any approximate size. Into the other end is screwed a threaded anvil for fine adjustment.

To set the gauge, loosen the chuck that clamps the wire rod, slide the rod out or into the required size, and clamp it. If not quite correct, loosen the chuck on the opposite end and turn the anvil out or in what little is needed.

Made from steel throughout, and nicely finished.

2½″ with 3 rods,	capacity from	2½″ to 6¾″	....	....	Price	**7/6**
3″ ,,	,, ,,	6″ to 16″	....	....	,,	**8/6**

Micrometer Caliper Gauges. Fig. 476 (No. 126.)



Designed for close internal measurements, indicating thousandths where a definite distance in inches is not essential. The body of the tool is in a steel tube, provided at one end with a binding chuck in which are fastened the plain rods, and it can quickly be adjusted to any approximate size. The other end has sleeve and body of barrel marked and graduated as our No 3 Micrometer Caliper, giving a reading in thousandths, and has a ¼″ movement of screw. Anvil in end of sleeve is hardened, as are the ends of rods. Extra rods at 3d. per inch.

Capacity 2½″ to 10″ (with 5 rods), Price **12/6 ;** case **5/3.**

Set No. **126M.,** in metric, 7c/m to 25c/m. Same price as above.

Fig. 478 (No. 440.) Micrometer Depth Gauge.

The gauge shown in the cut has been added to our line to meet the demand of mechanics who prefer a 1″ movement of the screw. It provides measurements of the depths of holes, projections, etc., from 0″ to 3″ by thousandths of an inch. Each gauge has three measuring rods with hardened and lapped ends with means for adjustment. The rods are inserted through a hole in the screw and brought to a positive seat by a small knurled nut. The base is 2½″ long and about 4/10″ thick, and is hardened, ground and lapped.

With 2½″ base.

No. **440,** in 1/1000″, 0″ to 3″, **£1 17s. 6d ;** case **7**s. **6**d.

With 4″ base.

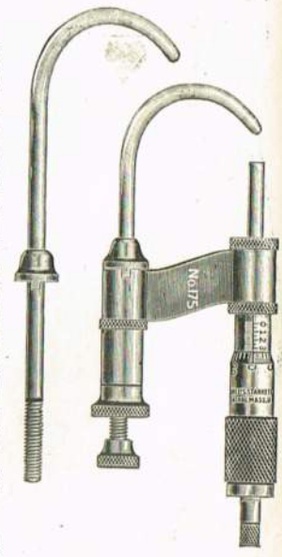
No. **440B,** in 1/1000″, 0″ to 3″, **£2 8s. ;** case **9s. 3d.**

No. **440MA,** as above, reading in m/m in 1/100m/m, 0m/m to 25m/m. Price **£1 17s. 6d ;** case **7s. 3d.**

No. **440MB,** Same as No. 440MA, but in 1/100m/m, 0m/m to 75m/m. Price **£2 8s. ;** case **9s. 3d.**

Fig. 477 (No. 175.) Micrometer Caliper Gauge.

This gauge was designed particularly for measuring the walls of cylindrical forms through a drilled hole in a flue or pipe where it would not be otherwise possible to secure accurate measurements. This gauge is made to read by thousandths of an inch and its peculiar construction makes it possible to obtain as exact readings as upon flat material. It is furnished with two anvils which are interchangeable, whereby measurements may be taken from 0″ to 2″. The anvils have a positive stop and are held fast to the seat containing a key-way, by the large nut. The smaller nut is used to turn the anvil when released from its seat. The small cut shows the anvil turned out of position. They are furnished with lock-nut and ratchet stop. A 1″ standard plug is also furnished to set the gauge when using the anvil for measurements from 1″ to 2″.



Price, with leather case, **£5 12s. 6d.**

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DEPTH GAUGES.

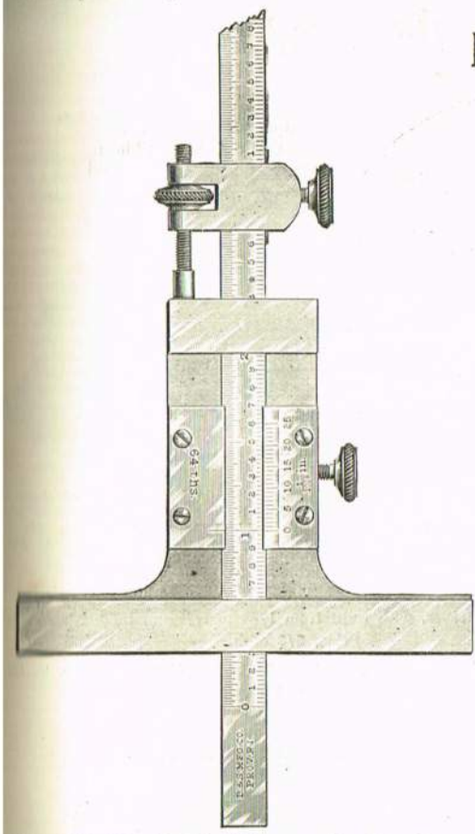

Fig. 479 (No. 600.) Vernier Depth Gauge.

6″ blade, ¼″ wide. Measure up to 3½″. Graduated on front to read 1/64″ on one corner, and by means of a vernier to1/1000″ on the other.

Price, **£3 0 3.** Case **7/6.**

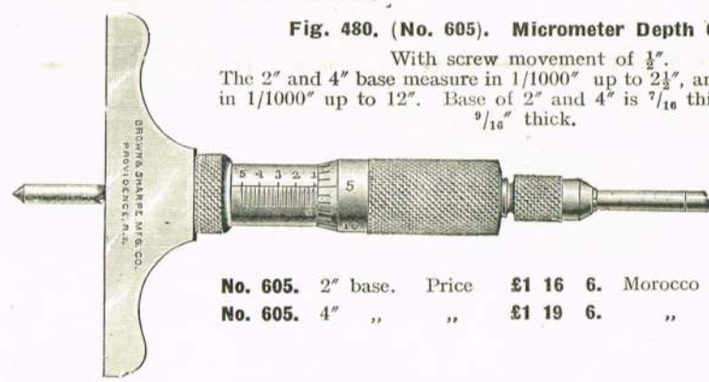

Fig. 480. (No. 605). Micrometer Depth Gauge.

With screw movement of ½″.
The 2″ and 4″ base measure in 1/1000″ up to 2½″, and the 4½″ base in 1/1000″ up to 12″. Base of 2″ and 4″ is $^{7}/_{16}$ thick, and of 4½″ $^{9}/_{16}$″ thick.

No. 605.	2″ base.	Price	**£1 16 6.**	Morocco case	**5/3**
No. 605.	4″ ,,	,,	**£1 19 6.**	,, ,,	**8/3**

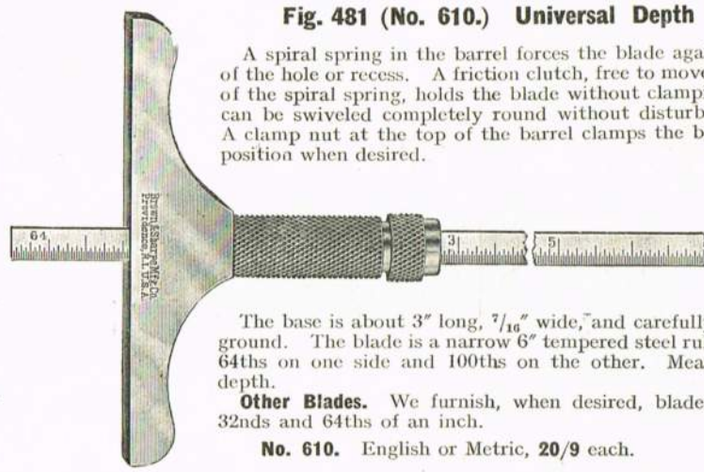

Fig. 481 (No. 610.) Universal Depth Gauge.

A spiral spring in the barrel forces the blade against the bottom of the hole or recess. A friction clutch, free to move under pressure of the spiral spring, holds the blade without clamping. The blade can be swiveled completely round without disturbing the setting. A clamp nut at the top of the barrel clamps the blade securely in position when desired.

The base is about 3″ long, $^{7}/_{16}$″ wide, and carefully hardened and ground. The blade is a narrow 6″ tempered steel rule, graduated to 64ths on one side and 100ths on the other. Measures to 3⅛″ in depth.

Other Blades. We furnish, when desired, blades graduated to 32nds and 64ths of an inch.

No. 610. English or Metric, **20/9** each.

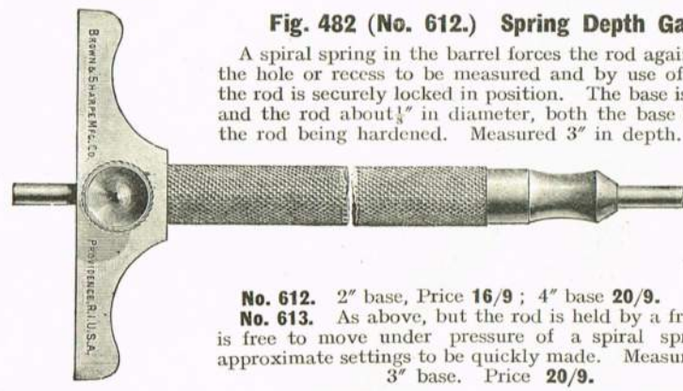

Fig. 482 (No. 612.) Spring Depth Gauge.

A spiral spring in the barrel forces the rod against the bottom of the hole or recess to be measured and by use of the clamp screw the rod is securely locked in position. The base is about $^{7}/_{16}$″ wide, and the rod about⅛″ in diameter, both the base and lower end of the rod being hardened. Measured 3″ in depth.

No. 612. 2″ base, Price **16/9** ; 4″ base **20/9.**
No. 613. As above, but the rod is held by a friction clutch that is free to move under pressure of a spiral spring and enables approximate settings to be quickly made. Measures to 4″ in depth. 3″ base. Price **20/9.**

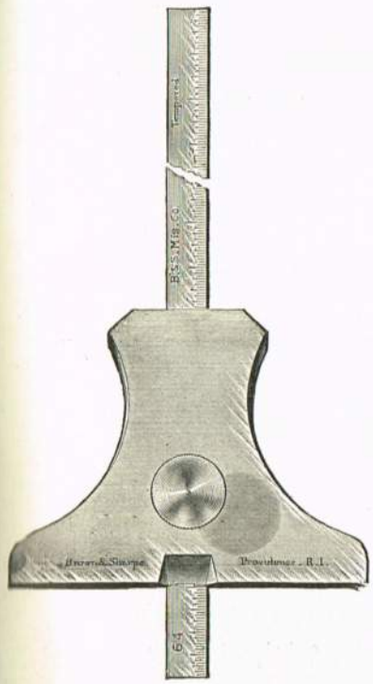

Fig. 483 No. 615. 6 in. Rule Depth Gauge

Illustration shows full size of the 6″, with hardened steel head, ⅛″ thick. Graduated 1/64ths on one side and 1/100″ on the other. Can be supplied divided 1/32″ and 1/64″ or 1/50″ and 1/100″.

Price, **6/3** each.

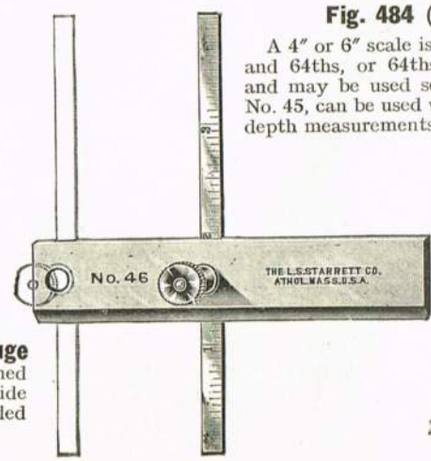

Fig. 484 (No. 46.) Starrett Depth Gauge.

A 4″ or 6″ scale is provided, $^{3}/_{16}$″ wide, graduated in either 32nds and 64ths, or 64ths and 100ths, indicating exact measurements, and may be used separately from the gauge. This tool, like our No. 45, can be used with the scale clamped close to the end, allowing depth measurements to be taken in difficult places.

Prices.

No. 46A.	With	3½″ stock and	4″ scale	**6/3**
No. 46B.	,,	3½ ,,	6″ ,,	**7/6**
No. 46C.	,,	6″ ,,	4″ ,,	**7/6**
No. 46D.	,,	6″ ,,	6″ ,,	**8/9**
No. 46E.	,,	10″ ,,	6″ ,,	**11/6**

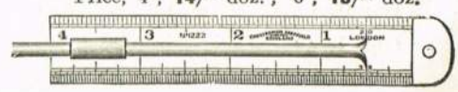

Fig. 485. Depth Gauge.

Best hardened and tempered steel.
Marked one side only in 1/20″ and 1/32″.
Price, 4″, **14/–** doz. ; 6″, **18/–** doz.

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RADIUS, THREAD, TOOL AND WIRE GAUGES.

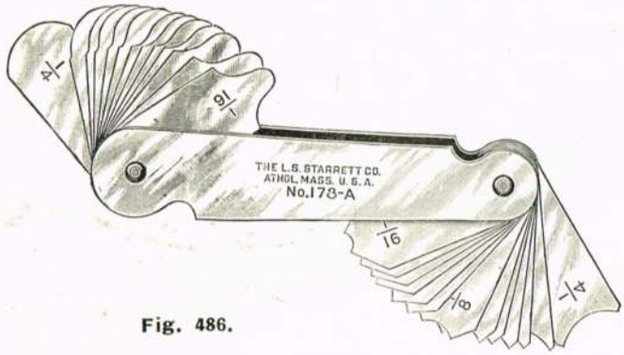

Fig. 486.

This gauge may be described as a concave and convex gauge, and is especially adapted for use in laying out special forming tools, dies, etc., as well as for measuring fillets. The illustrations show a few of the ways in which the gauge can be used. We recommend it for the use of machinists, tool makers, and screw machine operators, as well as pattern makers.

Size A has 20 leaves stamped to indicate radii by 64ths, from 1/32in. to 1/4in. (one-half diametric size). Diameters are from 1/16in. to 1/2in., varying by 32ds.

Size B is made with 32 leaves stamped to indicate radii by 64ths, from 17/64in. to 1/2in. Diameters are from 17/32in. to 1 in., varying by 32ds.

Price: **No. 178A, 6/3** each; **No. 178B, 8/6** each.

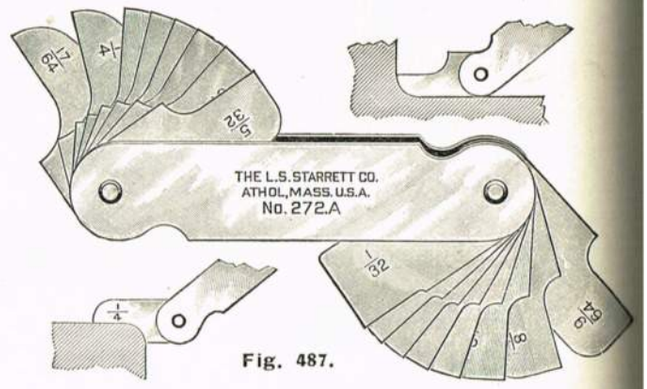

Fig. 487.

This gauge is similar in design to No. 178 and affords means of obtaining the radii of fillets, corners, etc., as shown by the illustrations. Each blade is stamped with the radius in 64ths, the externals being on one side and the internal on the other. It can be used in any position or at any angle, the formation allowing it to be used up to a shoulder, and for duplicating sample pieces. The studs holding blades in place are eccentric with the round end of case. This is of advantage, as when the gauge is opened the edge of case stands well away from the edge of the leaves.

Size A has 16 leaves, with radii from 1/32 to 17/64in., inclusive, by 64ths.

Price, **5/3** each.

Size B has 16 leaves, with radii from 9/32 to 33/64in., inclusive, by 64ths.

Price, **7/6** each.

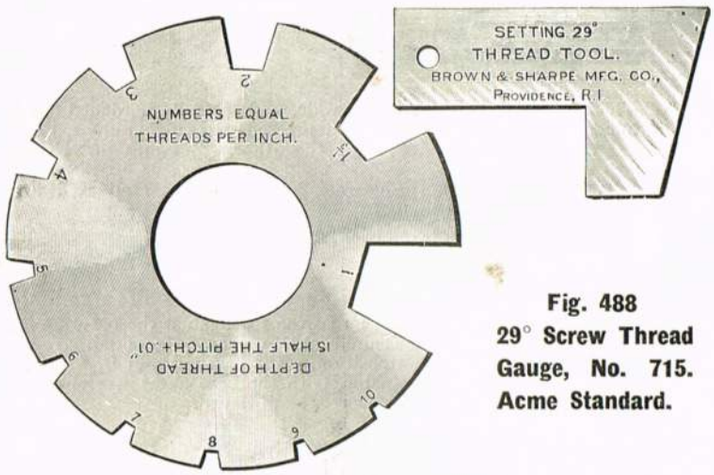

Fig. 488
29° Screw Thread Gauge, No. 715. Acme Standard.

The purpose of this gauge is to furnish a correct standard to which tools can be ground to cut threads of a uniform angle. The sides are an inclination of 14½° or 29° included angle. Complete with Tool Setting Gauge.

Price, **13/9** each.

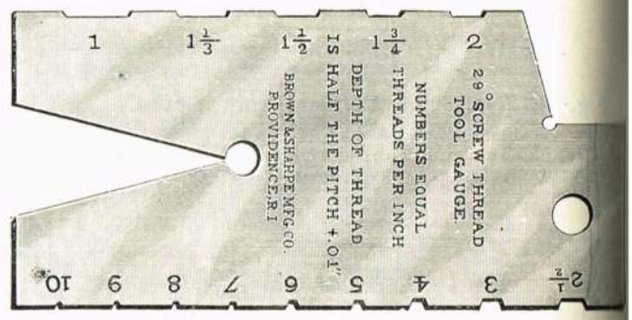

Fig. 489.

29° Improved Screw Thread Tool Gauge, No. 716. Acme Standard.

This gauge furnishes a correct standard to which tools can be ground for cutting threads of a uniform angle to take the place of square threads. The Acme thread has the same depth as the square thread, but as the sides are at an inclination of 14 1-2° (29° included angle) this form of thread is stronger.

Price, **12/6** each.

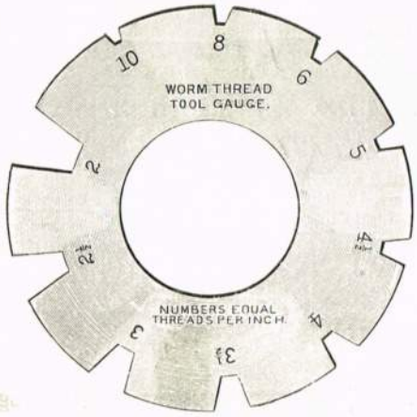

Fig. 490 (No. 720.) Worm Thread Tool Gauge.

No. 720. Furnishes the correct form for tools used in turning the threads of worms when the worm wheels are cut with involute cutters. The figures on the gauge correspond to the number of threads per inch of the worm.

Price, **12/6** each; with Tool Setting Gauge, **13/9** each.

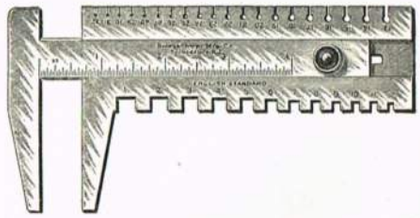

Fig. 491 (No. 677.) Caliper and Wire Gauge. English or Birmingham Standard.

Made of steel, 5 3/4″ long and about 3/16″ thick. The jaws are 2″ deep. The tongue is graduated on both sides to 32nds of an inch and can be drawn out to measure 4″. The gauge numbers are those of the English or Birmingham Standard and run from 1 to 32.

The tool is found especially useful for stock and store room purposes in selecting iron, steel, and sheet stock, also for iron and steel rollers and The Caliper is used for odd sizes of stock.

The tongue is graduated to 1/32nds. on both sides.

Price, **£2/16/3.**

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FEELER GAUGES, ETC.

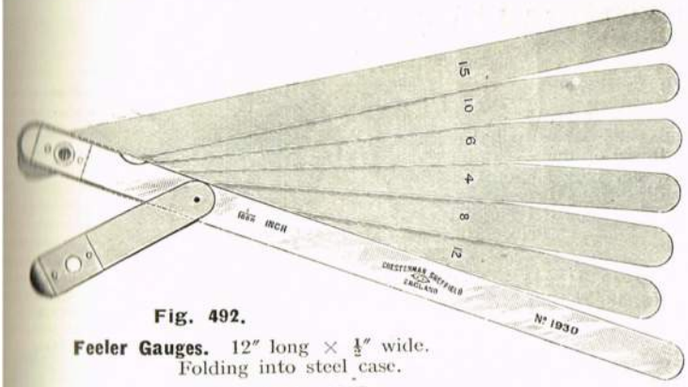

Fig. 492.

Feeler Gauges. 12″ long × ½″ wide. Folding into steel case.

Nos. 1930—1937.

Fig. 492. ENGLISH.

No. 1930. 6 blades, viz., 4, 6, 8, 10 12 and 15/1000ths of an inch. **80**/– dozen.

No. 1930/7. 8 blades, viz., 2, 3, 4, 6, 8, 10, 12 and 15/1000ths of an inch. **97**/– dozen.

No. 1930/15. 8 blades, viz, 5, 10, 15, 20, 25, 30, 35, and 40/1000ths of an inch. **97**/– dozen.

No. 1930/16. 10 blades, viz., 2, 3, 4, 6, 8, 10, 12, 15, 20 and 25/1000ths of an inch. **114**/– doz.

METRE.

No. 1933. 6 blades, viz., 10, 15, 20, 25, 30 and 40/100ths of a m/m. **80**/– dozen.

No. 1933/20. 6 blades, viz. 10, 20, 30, 50, 75 and 100/100ths of a m/m. **80**/– dozen.

No. 1933/21. 7 blades, viz., 10, 20, 30, 50, 75, 100 and 200/100ths of a m/m. **103/6** dozen.

No. 1933/7. 10 blades, viz., 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100/100ths of a m/m. **114**/– dozen.

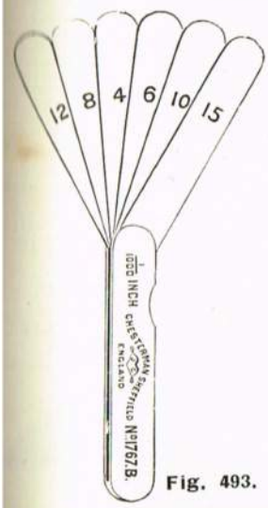

Fig. 493.

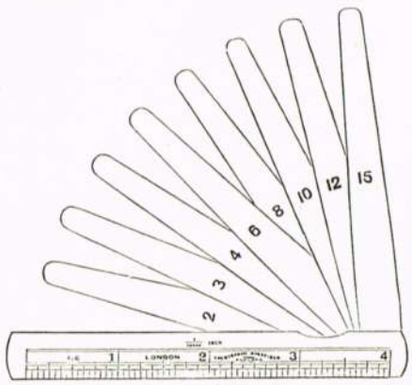

Fig. 494.

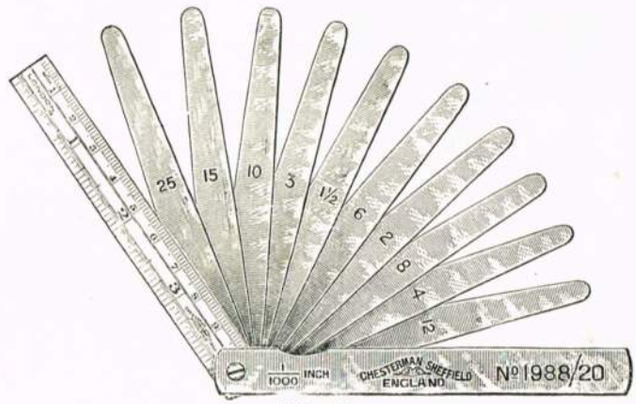

Fig. 495.

Cat. Nos. 1767/B to 1767/B3. 3″ × ½″.

No. 1767B. 6 blades, viz., 4, 6, 8, 10, 12, 15/1000ths of an inch. **24**/– dozen.

No. 1767B/7. 8 blades, viz., 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch. **30**/– dozen.

No. 1767B/3. 10 blades, viz., 2, 2, 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch. **36**/– dozen.

Cat. Nos. 1769 to 1874/7. 4″ × ½″.

Cat. Nos. 1988 to 1991/20.

No. 1877. Same as 1767B, but with tapered blades **27**/– doz.

No. 1877/7. ,, 1767B/7 ,, ,, **34**/– ,,

No. 1877/3. ,, 1767B/3 ,, ,, **41**/– ,,

Nos. 1769 to 1874/7. In case, graduated as rule, $^1/_{16}$ths on one side and m/m on the other.

No. 1769. 6 blades, viz., 4, 6, 8, 10, 12, 15/1000ths of an inch. **33**/– dozen.

No. 1769/3. 10 blades, viz., 2, 2, 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch. **51**/– dozen.

No. 1769/7. 8 blades, viz., 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch. **42**/– dozen.

No. 1874/7. 8 blades, viz., 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch. Case marked $^1/_{16}$ths inch on one side and 10, 20 and 50ths inch on other. **42**/– dozen.

Nos. 1988 to 1991/20. 4″ × ½″. Graduated Steel Rule in $^1/_{16}$ths. inch one side and m/m on the other.

No. 1988/7. 8 blades, viz., 2, 3, 4, 6, 8, 10, 12 15/1000ths of an inch. Steel rule marked $^1/_{16}$ths and m/m. **42**/– dozen.

No. 1988/20. 10 blades, viz., 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch. Steel rule marked $^1/_{16}$ths and m/m. **51**/– dozen.

No. 1989/7. 8 blades, viz., 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch. Steel rule marked 8, 16, 32, 64ths inch. **42**/– dozen.

No. 1989/20. 10 blades, viz., 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch, and steel rule marked 8, 16, 32 and 64ths inch. **51**/– dozen.

No. 1990/7. 8 blades, viz., 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch, and steel rule marked 16, 32, 64, 10, 20, 50, 100ths inch. **45**/– dozen.

No. 1990/20. 10 blades, viz., 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch, and steel rule marked 16, 32, 64, 10, 20, 50, 100ths inch. **54**/– doz.

No. 1991/7. 8 blades, viz., 2, 3, 4, 6, 8, 10, 12, 15/1000ths of an inch, and steel rule marked 16, 32, 64ths inch, c/m, m/m and halves. **43**/– dozen.

No. 1991/20. 10 blades, viz., 1½, 2, 3, 4, 6, 8, 10, 12, 15, 25/1000ths of an inch, and steel rule marked 16, 32, 64ths inch, c/m, m/m and halves. **52**/– dozen.

Fig. 496. Sets of Tools in Pocket Cases, comprising 9-blade feeler gauge, reading 1½, 2, 3, 4, 6, 8, 10, 12, 15/1000ths inch; 1 firm joint pocket caliper for inside or outside, and 1 9″×3-fold steel rule. Price complete **9**/– each.

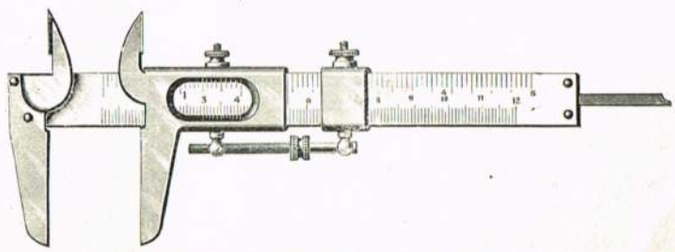

Fig. 497. Vernier Caliper, fitted with depth gauge and adjustment screw. Capacity 4¼″. Reading $^1/_{128}$″ and $^1/_{10}$th m/m. Price .... **8/6** each.

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SCREW PITCH AND FEELER GAUGES.

Screw Pitch Gauges by Brown & Sharpe.

Fig. 500.

No. 630. " V " Threads. **22 Pitches,** 9, 10, 11, 11½, 12, 13, 14, 15, 16,18, 20 on one end, and 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40 on the other. 22 Pitches, including pipe threads per inch, 11½ and 27. The 8 pitch can be determined by using the 16 pitch. Price, **5/3.**

No. 631. " V " Threads. Similar to 630. **24 Pitches,** 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½ and 12 on one end, and 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28 and 30 on the other. Price, **6/3.**

No. 632. " V " Threads. Similar to 630. **30 Pitches,** 4, 4½, 5, 5½, 6,7, 8, 9, 10, 11, 11½, 12, 13, 14, 15 on one end, and 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40 and 42 on the other. Price **7/4.**

No. 634. " V " Threads. Similar to 630. **22 Pitches, specially suitable for Automobile Engineers,** contains 22 blades in all, 32, 36, 38, 40, 42, 44, 46, 48, 50, 52 on one end, and 54, 56, 58, 60, 62, 64, 66, 68, 70, 72 and 74 on the other Price **5/3** each.

No. 636. System International. 17 Pitches, contains blades for the following pitches: ½, ¾, 1, 1¼, 1½, 1¾, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½ and 7 m/m. It also contains a blade with a gauge for grinding thread tools. Price, **5/3** each.

No. 637. Whitworth. Similar to 630. **22 Pitches,** contains 24 blades, with the following threads per inch: 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15 on one end, and 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 40 and 48 on the other. Price **6/3** each.

Starrett Feeler Gauges

Fig. 501.

No. 72. 22 leaves by 1/1000″ from ·004—·025, 3⅜″ × ½″. Price **10/6.**

No. 172A. 9 blades, ·0015″, ·002″, ·003″, ·004″, ·006″, ·008″, ·010″, ·012″, ·015″, 4¾″ × ½″. Price .... **6/3.**

No. 172B. 8 Taper Blades, omitting ·0015. Price .... **10/6.**

No. 172C. 8 Taper Blades, omitting ·0015.″ Size 6¼″ × ½″. Price .... **12/6.**

Screw Pitch Gauges by Starrett.

Fig. 503.

No. 4. 24 Pitches, 4, 4½, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30. Price, **6/3.**

No. 5. 26 Pitches, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82. Price, **6/3.**

No. 6. 30 Pitches, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42. Price **7/6.**

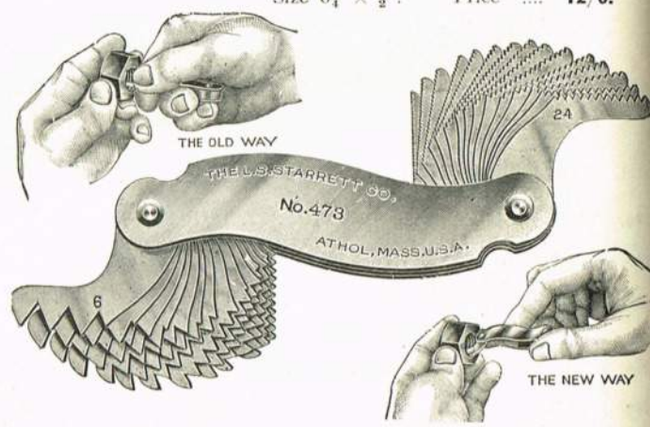
No. 7. Whitworth. 26 Pitches, 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 40, 48, 60. Price, **6/3.**

No. 40. Improved Pattern. 22 Pitches, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40. Price, **5/3.**

No. 156. Metric. 26 Pitches, .25, .30, .35, .40, .45, .50, .55, .60, .65, .70, .75, .80, .85, .90, 1.00, 1.20, 1.25, 1.30, 1.40, 1.50, 1.60, 1.70, 1.75, 1.80, 1.90, 2.00, 2.50. Price, **5/3.**

No. 158. 17 Pitches, with Centre Gauge International System, 0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.6, 6.0, 6.5, 7 m/m. Price, **5/3.**

No. 159. 22 Pitches, Metric System, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 10.5, 11.0, 11.5. Price, **7/6.**



No. 473. Positive Stop Gauge. Leaves are held in position by a patent stop. **30 Pitches,** V Thread, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22 and 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42, 48, 50, 56, 60. Price, **7/6.**

Feeler or Thicknes Gauges.

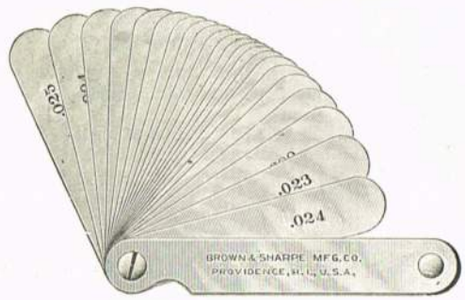
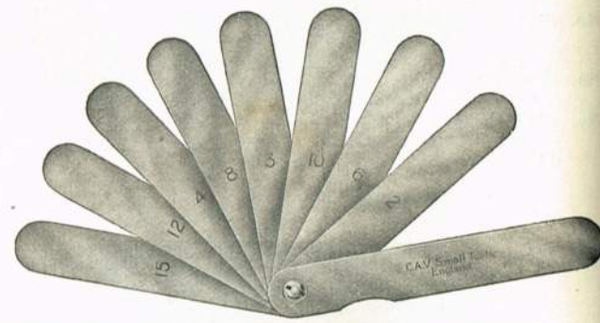


Fig. 502.



No. 640. 22 Steel Blades, reading by 1/1000″ from ·004″ to ·025″. Blades are $2^5/_{16}$″ × $^7/_{16}$″. Price **10/6.**

No. 641. Metric, 14 blades, ·05, ·06, ·07, ·08, ·09, ·10, ·15, ·20, ·25, ·30, ·40, ·50, ·75, 1 m/m. Price **10/6.**

No. 642. 9 blades, ·0015″, ·002″, ·003″, ·004″, ·006″, ·008″, ·010″, ·012″ .015.″. Price **6/3.**

No. 643. Metric, 9 blades, ·04, ·05, ·08, ·10, ·15, ·20, ·25, 30, ·35 m/m. **6/3.**

Fig. 504. C.A.V. 8 steel blades. Dimensions 3⅛″ × ½″, ·002″, ·003″ ·004″, ·006″, ·008″, ·010″, ·012″, ·015″. Price .... **3/6.**

No. 646. Brown & Sharpe. Similar to No. 640 with only 6 blades, ·0015″ to ·015″. Price .... **3/9.**

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WIRE GAUGES.

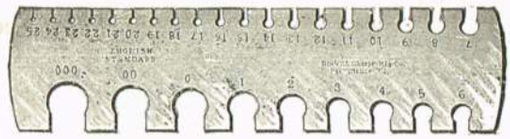

Fig. 505 (No. 684.) Rolling Mill Gauge.

English or Birmingham standard. Shewn ⅜rds. Size $\frac{3}{16}''$ thick. Steel hardened and tempered. Numbers 000 to 25, **16/9** each; numbers 1 to 32, **19/9** each.

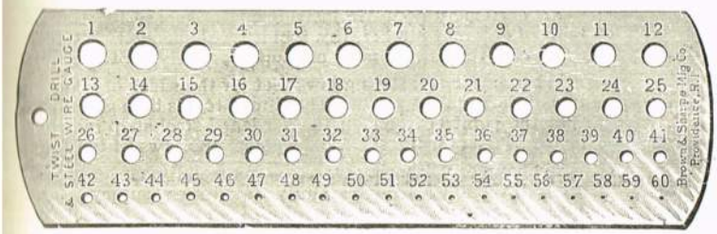

Fig. 506 (No. 705.) Twist Drill and Steel Wire Gauge.

The larger size contains gauge numbers 1 to 60; is $\frac{1}{16}'' \times 5\frac{1}{4}'' \times 1\frac{5}{8}''$, with decimal equivalents on reverse side. The smaller size contains gauge numbers 61 to 80; is $\frac{1}{16}'' \times \frac{3}{4}'' \times 2''$. Both finished in black. Carefully tested after hardening. Nos. 1 to 60, price **8/3** each; Nos. 61 to 80, price **10/- each.**

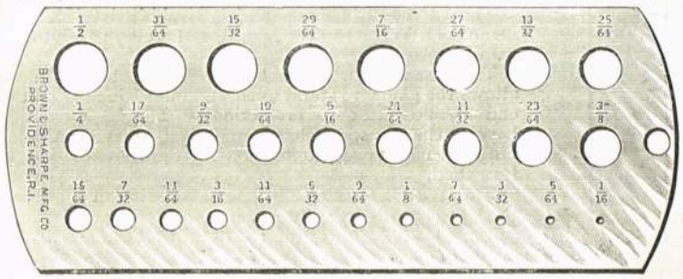

Fig. 508 (No. 710.) Jobbers' Drill Gauge.

Hardened and tempered steel. Price, **11/6** each.

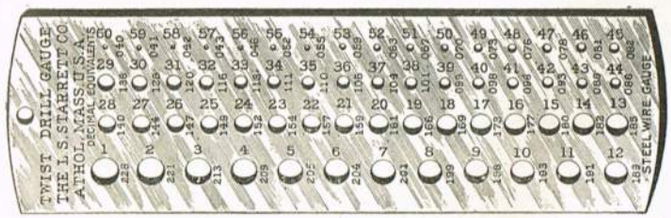

Fig. 509 (No. 186.) Drill and Steel Wire Gauge.

It gives the number of drill to fit each hole and the size of the hole in thousandths of an inch. Price **8/6.**

Fig. 507
(No. 690) English or Birmingham Standard Wire Gauge

With decimal equivalents on reverse side. Nos. 1—36, price **12/6** each; Nos. 6—36, price **10/6** each.

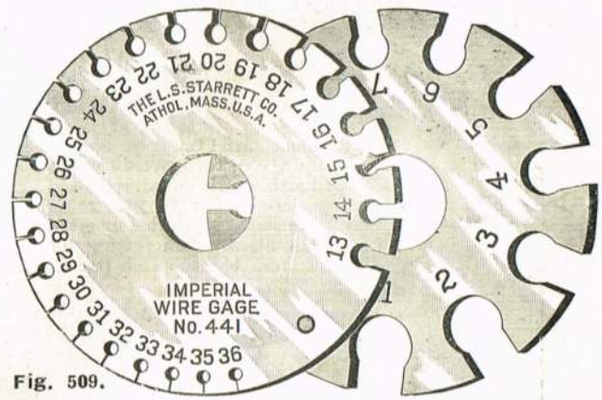

Fig. 509.

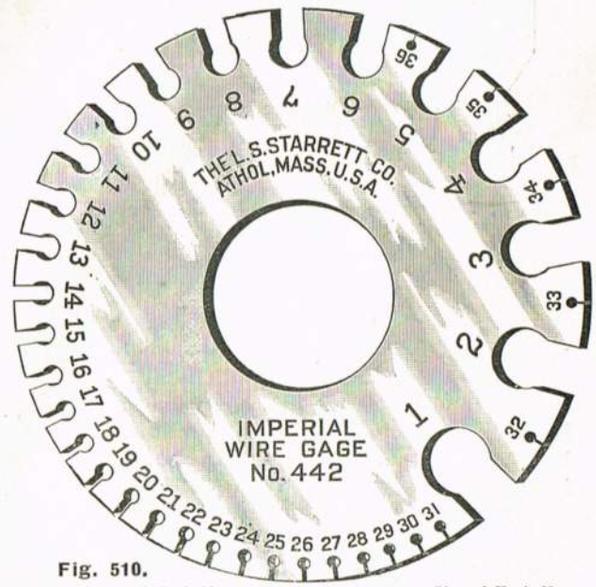

Fig. 510.

Fig. 509/10 Imperial Standard Wire Gauges. Nos. 441 and 442.

Sizes of the numbers of the Imperial Standard Wire Gauges with decimal equivalents, which are stamped on the other side of each. Price, **No. 441,** Nos. 1—36, **14/9**; price, **No. 442,** No. 1—36, **12/6** each.

No. of wire gauge 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36.

Size of each:—

No. of Wire Gauge	Size of Each No. in Decimal Parts of an Inch.	No. of Wire Gauge	Size of Each No. in Decimal Parts of an Inch.	No. of Wire Gauge	Size of Each No. in Decimal Parts of an Inch.	No. of Wire Gauge	Size of Each No. in Decimal Parts of an Inch.
1 ...	.300	10 ...	.128	19 ...	.040	28 ...	.0148
2 ...	.276	11 ...	.116	20 ...	.036	29 ...	.0136
3 ...	.252	12 ...	.104	21 ...	.032	30 ...	.0124
4 ...	.232	13 ...	.092	22 ...	.028	31 ...	.0116
5 ...	.212	14 ...	.080	23 ...	.024	32 ...	.0108
6 ...	.192	15 ...	.072	24 ...	.022	33 ...	.010
7 ...	.176	16 ...	.064	25 ...	.020	34 ...	.0092
8 ...	.160	17 ...	.056	26 ...	.018	35 ...	.0084
9 ...	.144	18 ...	.048	27 ...	.0164	36 ...	.0076

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VERNIER GAUGES.

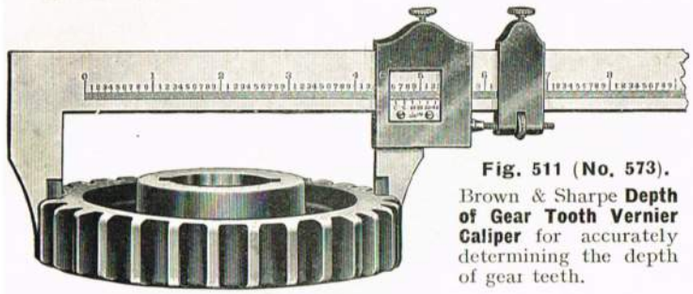


Fig. 511 (No. 573).
Brown & Sharpe **Depth of Gear Tooth Vernier Caliper** for accurately determining the depth of gear teeth.

Price, £**6 5 0** in Finished Wooden Case, £**7 1 9**.

Measuring the bottom diameter of gears provides an accurate check on the cutting operation and insures the duplication of any desired standard.

This tool, therefore, is found especially valuable in the Automobile Shop for measuring automobile transmission gears where it is impossible to use our regular Vernier Calipers on account of the thickness of the jaws.

Being very similar to our 12 in. Vernier Caliper with the exception of the shape of the jaws, this tool can also be used for outside measurements. Graduated on one side only.

Depth of jaws, 1 7-8 in. Width of measuring surface, 1-32 in.

An explanation of the Vernier is sent with each Caliper.

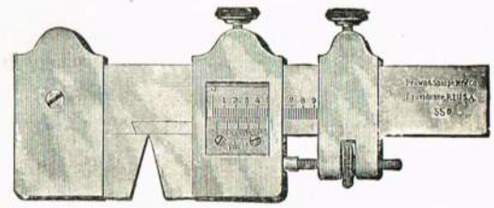


Fig. 512.
(No. **576.**) **Thread Tool Vernier,** English and Metric 29°, 55°, or 60°, in morocco case, £**5 11 6**.

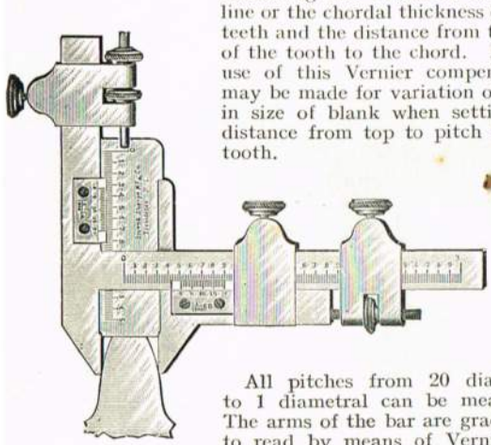
An extremely accurate instrument for measuring thread tools of different pitches, this tool is recommended. It does away with the large number of gauges formerly kept on hand.

When in use, the sliding jaw is set for the width of point of tool of the required pitch. The thread tool is then ground so that the point bottoms on the hardened-steel strip inserted in the blade and the sides rest against the jaws of the tool.

The jaws or measuring surfaces are carefully hardened and ground, the angle being carefully tested for accuracy. The Vernier reads to thousandths of an inch on one side of the tool, and to 50ths of a millimetre on the other. The tool is graduated for only one inch and twenty-five millimetres on the respective sides.

Fig. 514 (No. 580). Gear Tooth Vernier.

For the purpose of accurately measuring the thickness at pitch line or the chordal thickness of gear teeth and the distance from the top of the tooth to the chord. By the use of this Vernier compensation may be made for variation or error in size of blank when setting for distance from top to pitch line of tooth.



All pitches from 20 diametral to 1 diametral can be measured. The arms of the bar are graduated to read by means of Verniers to thousandths of an inch.

The thickness of the tooth at pitch line and the addendum are measured respectively by a jaw and tongue which move upon these arms. Both the sliding jaw and tongue are provided with adjusting screws.

Prices in morocco case: Reading 20 to 2 diametrical pitch £**8 18**s. **3**d.

Reading 10 to 1 diametrical pitch, £**13 2**s. **6**d.

No. **581**, same as 580 but graduated in metric.

Reading 1¼ m/m to 12 m/m, £**8 18**s. **3**d.

Reading 2½ m/m to 25 m/m, £**13 2**s. **6**d.

Fig. 513 (No. 585). Vernier Height Gauge.

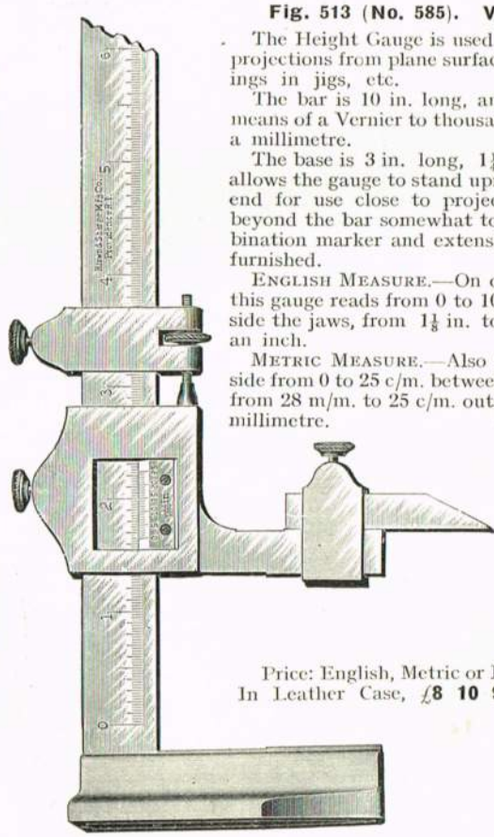
The Height Gauge is used for obtaining the height of projections from plane surfaces, for the location of bushings in jigs, etc.

The bar is 10 in. long, and is graduated to read by means of a Vernier to thousandths of an inch or 50ths of a millimetre.

The base is 3 in. long, 1¼ in. wide, and ¾ in. high, allows the gauge to stand upright, and is rounded on the end for use close to projections. The base extends beyond the bar somewhat to insure stability. A combination marker and extension for the movable jaw is furnished.

English Measure.—On one side, between the jaws, this gauge reads from 0 to 10 in., and on the other, outside the jaws, from 1⅛ in. to 10 in. by thousandths of an inch.

Metric Measure.—Also graduated to read on one side from 0 to 25 c/m. between the jaws, and on the other from 28 m/m. to 25 c/m. outside the jaws, by 50ths of a millimetre.



English and Metric Measure.—Also graduated to read on one side from 1⅛ in. to 10 in. by thousandths of an inch, and on the other, from 28 m/m to 25 c/m by 50ths of a millimetre. Both these measurements are outside the jaws.

Price: English, Metric or English and Metric, **£7 10 0**.
In Leather Case, £**8 10 9**.

Fig. 515 (No. 725). Depth of Gear Tooth Gauges.

Depth of Gear Tooth Gauges for all regular pitches, from 3 to 48 pitch, inclusive, are carried in stock. One gauge answers for each pitch and indicates the extreme depth to be cut. Price, **3/3** each.

Fig. 516 (No. 598). B. & S. Height Gauge Attachment.

For use with Inside Micrometers, **260** & **261**.

This is a base with a thumb screw for use with an inside micrometer, thus converting it into a reliable height gauge.

Price, **9/6** each.

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VERNIER CALIPERS.

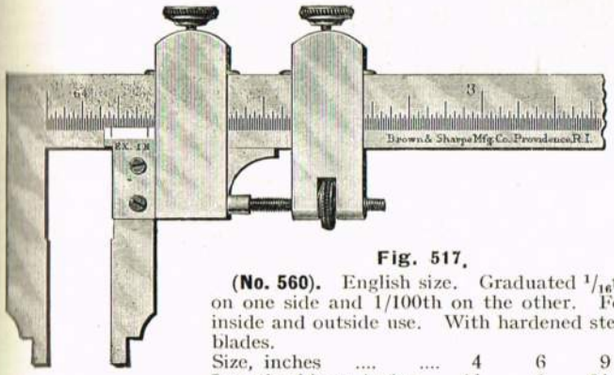


Fig. 517.

(No. 560). English size. Graduated $^1/_{16}$th on one side and 1/100th on the other. For inside and outside use. With hardened steel blades.

Size, inches	4	6	9
Length of jaws, inches....	$1\frac{1}{2}$	2	$3\frac{1}{4}$
Width of jaws, inches	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$
Price each without adjustment screw	**37/6**	**45/–**	**62/6**
With adjustment screw	**42/6**	**55/–**	**72/6**

No. 561 Metric, and No. **562** English and Metric, same price.

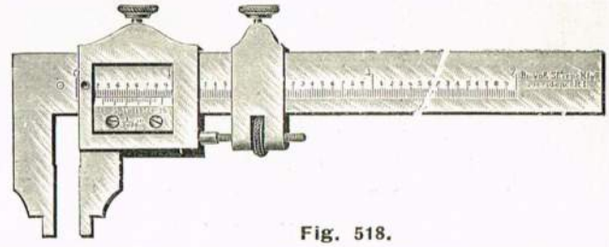


Fig. 518.

(No. 570.) English size. Graduated front and back to read by means of a vernier to 1/1000″. Takes inside as well as outside measurements. Jaws hardened and ground. A $\frac{1}{4}$″ Standard can be supplied for testing the accuracy of the tool, **18/9** extra.

Size, inches	6	12	24
Length of jaw, inches	$1\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$
Width of jaw, inches	$\frac{1}{4}$	$^3/_{10}$	$^3/_{10}$
Price in case, each	**100/–**	**125/–**	**175/–**

6″ is the pocket size.

No. 571 Metric size, **No. 572** English and Metric Size, same price as No. 570.

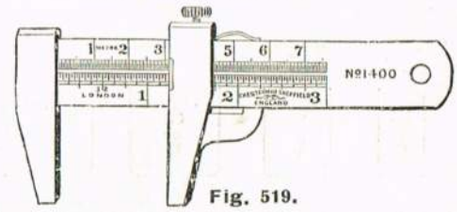


Fig. 519.

No. 1400. Divided on one side, inches into 32nds, c/m. into m/m., and halves.
3″ **9/–**; 4″ **10/–**; 6″ **11/–** each.

No. 1401. Divided on both sides, inches into 32nds, 48ths and 50ths, c/m. to m/m., and halves.
3″ **10/–**; 4″ **11/–**; 6″ **12/–** each.

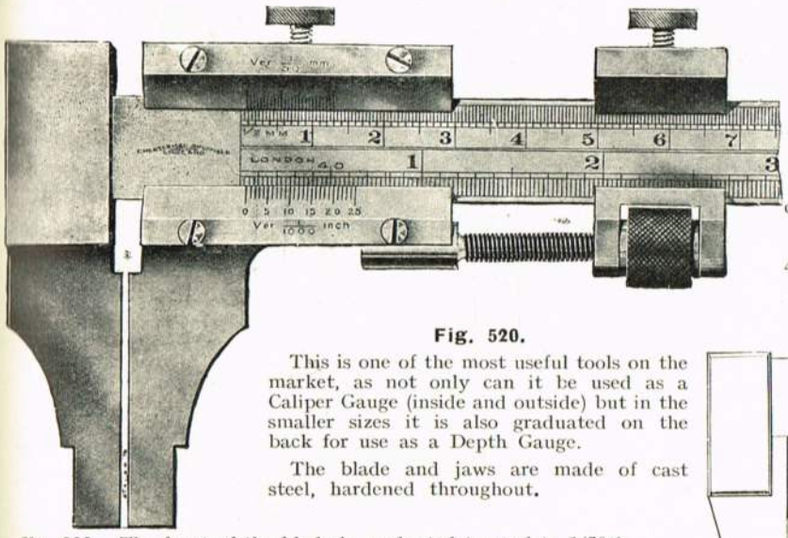


Fig. 520.

This is one of the most useful tools on the market, as not only can it be used as a Caliper Gauge (inside and outside) but in the smaller sizes it is also graduated on the back for use as a Depth Gauge.

The blade and jaws are made of cast steel, hardened throughout.

No. 360. The front of the blade is graduated to read to 1/50th millimetre and 1/1000th inch, and the back is graduated in $^1/_{32}$ of an inch for use either as caliper or depth gauge.
Prices upon application.

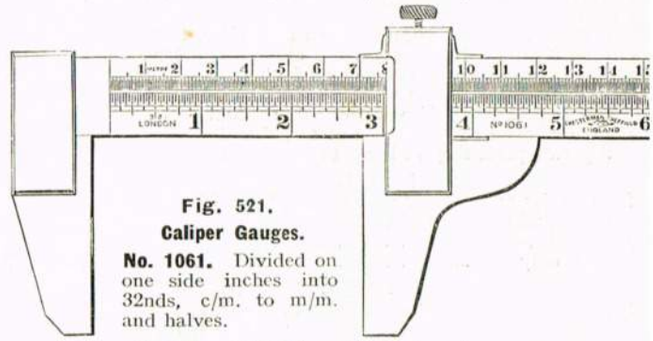


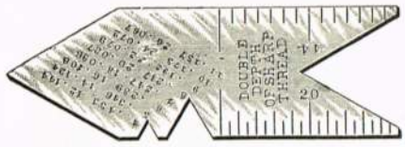
Fig. 521.
Caliper Gauges.

No. 1061. Divided on one side inches into 32nds, c/m. to m/m. and halves.
9″ **18/–**; 12″ **21/–**; 18″ **30/–** each.

No. 1063. Divided on both sides, inches into 32nds, 48ths, 50ths, c/m. to m/m and halves.
9″ **20/–**; 12″ **24/–**; 18″ **36/–** each.

No. 1064. Divided on one side, inches into 32nds, 50ths.
9″ **18/–**; 12″ **21/–**; 18″ **30/–** each.

Fig. 522. CENTRE GAUGES.



No. 650.	U.S. Standard. 60°.	**1/9** each.	Tempered **2/–**
No. 651.	Whitworth. 55°.	**1/9** each.	Tempered **2/–**
No. 652.	Metric. 60°.	**1/9** each.	Tempered **2/–**

Fig. 522 (No. 878). Hardened and Tempered Steel **Centre Gauge.** Whitworth 55°, inches into 24, 32, 14 and 20ths. **9d.** each.

Fig. 522a (No. 879). U.S. Standards, 60°, into 24, 32, 14 and 24ths. **9d.** each.

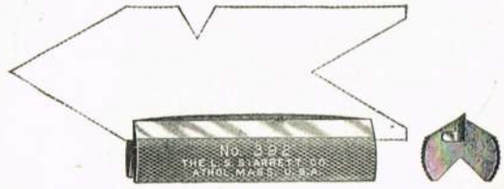


Fig. 523 (No. 392). Starrett Centre Gauge Attachment.

The above attachment is a V block with a slot above the V, containing a flat spring to frictionally hold the centre gauge parallel with the block. Placing the V block against a lathe spindle or face plate, a threading tool can be adjusted to line perfectly to cut both sides of a thread to the proper angle, eliminating uncertainty, for both external and internal work.
Price for attachment .... **2/3.**

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STEEL RULES, Etc.

All No. 4 Graduation.

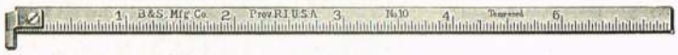
Length	4″	6″	9″	12″	18″	24″	36″
Width	19/32	11/16	53/64	31/32	1	1	1
Price each	**4/6**	**5/3**	**7/3**	**9/–**	**13/–**	**15/9**	**31/9**

Fig. 524 (No. 320). Tempered Hook Rules.

The Hook Rules listed on this page are of the latest design. The hardened hook is reversible and attached to the rule in what we believe to be the simplest and most practical manner yet devised, being held by a single screw. It cannot pull off.

When it is desired to use the rule as a standard steel rule, the hook may be quickly detached and the screw replaced in the hook. There are no loose parts to be lost.

Fig. 524 (No. 325). Narrow Tempered Hook Rules.



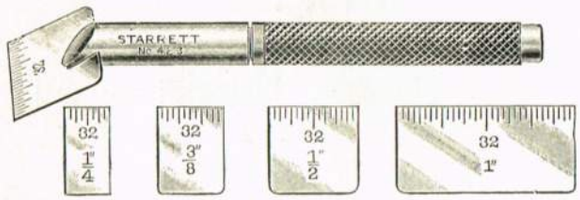
Hook Rules furnished with metric graduations when ordered. Prices as listed above.

Differ from hook rules No. 320 only in that the rules are narrow and allow measurements to be taken through a hole ⅜″ in diameter.

Length	4″	6″	9″	12″
No. of graduation	10	10	10	10
Price each	**4/3**	**5/–**	**7/–**	**8/3**

STEEL RULES WITH HOLDER.

Fig. 524 (No. 423). Starrett.



English or Metric Measure.

These rules and holder, shown full size, are convenient where the ordinary rule cannot be used, as in measuring a recess or key-way, as well as the general class of tool and die work.

The holder takes either of the five sizes of rules. The barrel is knurled for finger grip. The rules are held in a split chuck, adjusted by a knurled nut at the top of the barrel and can be set at various angles according to the work. The rules are of tempered steel.

English Measure. Graduated on both sides, to 32nds of an inch on one side and to 64ths on the other. The 1″ and ½″ are also furnished graduated to 50ths of an inch on one side and 100ths on the other.

Metric Measure. Also furnished graduated on one side to millimetres and on the other side to half millimetres

Separate parts may be bought as follows :

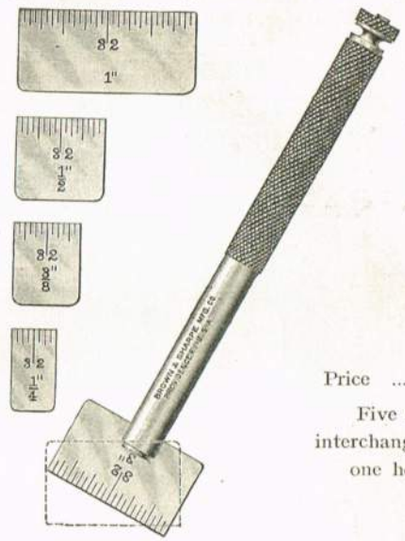
No. 423. English.

Set of rules and holder, comprising ¼″, ⅜″, ½″, ¾″ and 1″ in length, with 32nds and 64ths graduations	**10/6**
Rules only, all lengths .... Each	**1/6**
Holder only	**3/3**

No. 423M. Metric.

Set of rules and holder, comprising 5, 10, 15, 20 and 25 m/m in length, with millimetres on one side and half-millimetre graduations on the other side	**10/6**
Rules only, all lengths .... Each	**1/6**
Holder only	**3/3**

Fig. 527 (No. 335). Brown & Sharpe.



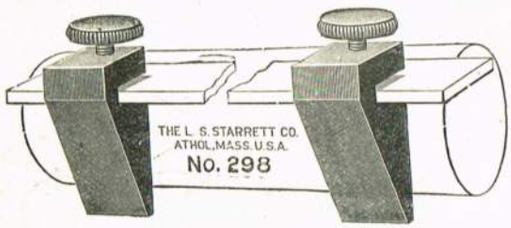
Price .... **10/5.**

Five rules interchangeable in one holder.

Length, inches	¼″	⅜″	½″	¾″	1″
Length, m/m	5	10	15	20	25
Price of Rules	**1/6**	**1/6**	**1/6**	**1/6**	**1/6**
Price Complete	**3/3**	**3/3**	**3/3**	**3/3**	**3/3**

Five Rules, interchangeable, in one Holder .... Price **10/6**

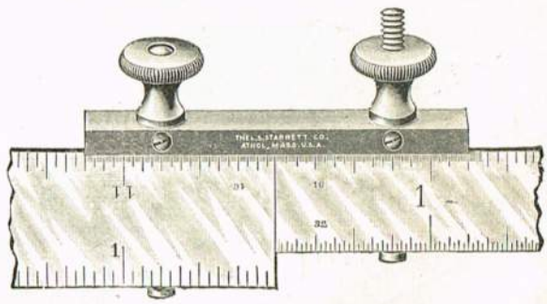
Fig. 529 (No. 298). Starrett Key Seat Clamps.



Designed to transform any common steel scale into a key-seat rule; and a valuable addition to any machinist's kit. They are made of steel, case hardened and accurately ground. A pair weighs but an ounce. They may be put on or taken off almost instantly, and are a complete substitute for a more costly tool. They may be used with our Combination Square Blades or with any straight rule with accurate results.

Price per pair .... **3/3.**

Fig. 528 (No. 299). Starrett Rule Clamps.



This little tool is used to clamp two steel rules together, end to end, making one long rule. The rules may be of the same or different widths up to 1¼″. This clamp will be of special value to mechanics, whose tool chests will usually not hold rules longer than 12″.

Price .... **2/6.**

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STEEL CALIPER RULES.

Fig. 530.

(B. & S. No. 380.) English, 6″ long, $^{9}/_{16}$″ wide, $^{1}/_{16}$″ thick, with No. 4 graduation.

Price ... **8/3** each.

Metric graduated on three corners to millimetres and on one corner to ½-m/m.

Price ... **8/3** each.

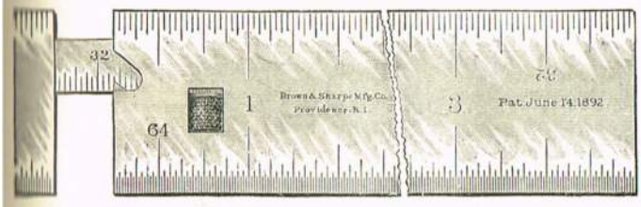


Fig. 532. (B. & S. No. 391). English.

Convenient for use in the stock room or store, in selecting sheet or bar stock, wire, tubing, etc. The slide of the 3″ can be drawn out to measure 2¼″, and that of the 4″ to measure 3¼″.

They are divided into parts of an inch as follows :

			C	D
1st corner	....	....	8	8
2nd corner	....	....	16	16
3rd corner	....	....	32	32
4th corner	....	....	64	64
Slide	....	....	32 and 64	64 and 100

In ordering state whether Style C or D is desired.

Length, 3″ .... **20/9** each. Length 4″ .... **23**/– each.

The 3″ rule can be furnished nickel plated when desired.

Fig. 531. (B. & S. No. 385).

English, $4^{3}/_{16}$″ long, $^{1}/_{16}$″ thick. Graduated on both corners to $^{1}/_{32}$″. Jaw ⅜″ deep.

Metric.—Graduated in ½-m/m. Price .... **10/6** each.

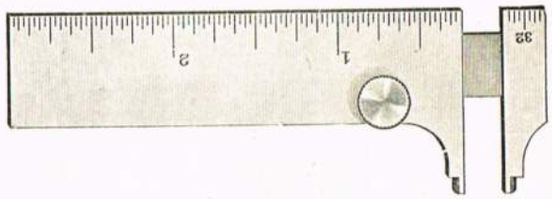


Fig. 533. (B. & S. No. 388). Pocket Caliper Rule.

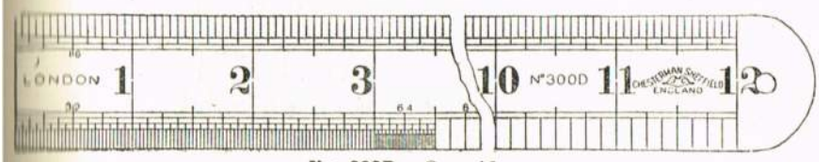
On one side it is graduated as an ordinary 3″ rule, the graduations reading to 32nd of an inch. On the other side it is used as a button rule, the graduations on the slide reading to 40ths of an inch. It has a range of 2″ and both external and internal measurements can be made. When the slide is set for any particular measurement, it can be securely clamped in position by a clamp nut.

English Measure. Graduated on one corner of one side to 32nds. On the other side the slide is graduated to 64ths and has a range of 2″. The jaws are ⅜″ deep. The nibs can be inserted in holes ⅛″ in diam.

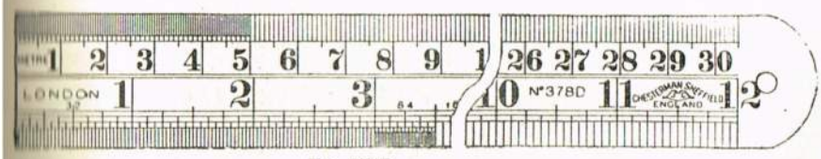
Metric Measure. Graduated to millimetres and half millimetres. When the slide is set for any particular measurement, it can be securely clamped in position by a clamp nut. Price **16/8.**

Fig. No. 535. CHESTERMAN'S STEEL RULES.

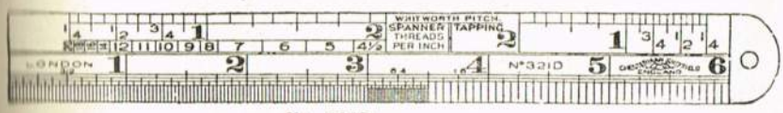
Machine divided.



No. 332D. One side.



No. 378D



No. 321D.

Can be supplied without the D-shape end. When required square both ends omit the letter **D.** 3″, 4″ and 6″ rules are ¾″ wide × 3/100″ thick. 12″ rules are 1⅛″ wide × 4/100″ thick. The figure 2 after the letter D signifies, on the single-sided rules that the rule is narrower and thinner than that without the figure 2 ; likewise the figure 3 on the rules marked both sides.

Cat. No. Ordinary Pattern	Cat. No. Narrow Pattern	Graduation	Sizes and Prices Per dozen. 3″	4″	6″	12″
		Marked Top and Bottom, One Side.				
300D	**300D/2**	8, 16, 32, 64ths ins.	**7**/–	**7**/–	**8**/–	**15**/–
310D	**310D/2**	16, 32, 64, 10, 20, 50 100ths ins.	**9**/–	**9**/–	**10**/–	**16**/–
312D	**312D/2**	8, 16ths ins.	**6**/–	**6**/–	**7**/–	**12**/–
321D	**321D/2**	16, 32, 64ths, **Tapping and Spanner Sizes**	—	**9**/–	**10**/–	**16**/–
378D	**378D/2**	c/m to m/m and ½m/m, 16, 32, 64ths ins.	**8**/–	**8**/–	**10**/–	**18**/–
379D		c/m to m/m and ½m/m, 10, 20 50ths ins.	—	**8**/–	**10**/–	**18**/–
390D	**390D/2**	32 and 64ths	**9**/–	**9**/–	**10**/–	**18**/–
391D	**391D/2**	16 and 32nds	—	**7**/–	**8**/–	**16**/–
392D	**392D/2**	64 and 100ths	—	**14**/–	**16**/–	**24**/–
		Marked Top and Bottom, Both Sides.				
322D		16, 32, 64, 10, 20, 50, 100ths, Tapping and Spanner sizes	—	**12**/–	**14**/–	**22**/–
323D		8, 16, 32, 64ths, Tapping and Spanner sizes	—	—	**14**/–	**20**/–
325D		8, 16, 32, 64ths Tapping and Spanner sizes	**12**/–	**12**/–	**14**/–	—
328D		8, 16, 32, 64ths	**10**/–	**10**/–	**12**/–	**18**/–
332D	**332D/3**	8, 16, 32, 64ths	—	**10**/–	**12**/–	**20**/–
403D	**403D/3**	16, 32, 64, 10, 20, 50, 100ths	**10**/–	**10**/–	**12**/–	**20**/–
410D		16, 10, 12ths and c/m to m/m	**10**/–	**10**/–	**12**/–	**20**/–
412D		16, 32, 64, 10, 20, 50, 100, 12, 24, 48, 96, c/m to m/m and ½m/m	**12**/–	**12**/–	**14**/–	**24**/–
1358D		8, 16ths, c/m to m/m	—	**10**/–	**12**/–	**18**/–
1361D		16, 32, 64, 10, 20, 40, 50, 100, Tapping and Spanner sizes and c/m to m/m and ½m/m	—	—	—	**24**/–
1555D	**1555D/3**	8, 16, 32, 64, 12, 24, 48, 96, 10, 20, 50, 100ths, c/m to m/m and ½m/m	—	**12**/–	**14**/–	**24**/–
1561D	**1561D/3**	16, 32, 64, 10, 20, 50, 100ths and c/m to m/m and ½m/m	—	**12**/–	**14**/–	**24**/–

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RULES.

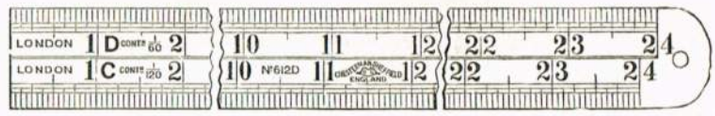

Fig. 536.

STEEL CONTRACTION RULES. No. 612 D.

A equals contraction	1/96	or 1/8	inch to foot	....	Cast metal	A.
B. ,, ,,	1/48	or 1/4	,, ,,	....	Double metal	B.
C. ,, ,,	1/120	or 1/10	,, ,,	....	Steel or iron	C.
D. ,, ,,	1/60	or 1/5	,, ,,	....	Double steel	D.
K ,, ,,	1/64	or 3/16	,, ,,	...	Brass	K.
E ,, ,,	1/100	or 1 in 100		....		E.
H. ,, ,,	1/50	or 1 in 50		....		H.
O. ,, ,,	1/38	or 5/16 inch to foot		....		O.

Contractions vary with different mixtures, therefore the figures quoted must not be taken too literally.

No.			Each.		Each.
612D.	Inches into 16ths, contractions D and C one side	12″	**1/3**	24″	**4/–**
1084D.	,, ,, ,, D and Standard one side ...	12″	**1/3**	24″	**4/–**
1274D.	,, ,, ,, C ,, ,, ...	12″	**1/3**	24″	**4/–**
320D.	,, ,, ,, C, D, and Standard both sides	12″	**1/8**	24″	**6/6**
618D.	,, ,, ,, A, K, C, ,, ,, ...	12″	**1/10**	24″	**6/6**
1291D.	,, ,, ,, K, C, D, ,, ,, ...	12″	**1/10**	24″	**6/6**

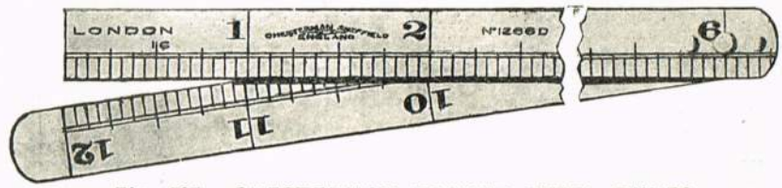

Fig. 537. CHESTERMAN POCKET STEEL RULES.

With 6″ stop joints. Machine divided. ⅜″ wide × 2/100″ thick 12″ only is provided with D ends, others square.

		12″	24″	36″
No. **1266.**	Inches into 16ths, one side only	**6/–**	**13/–**	**21/–** doz.
No. **1267.**	,, ,, 20ths, ,, ,,			
No. **1301.**	,, ,, 16ths and m/m, one side only	**8/–**	**16/–**	—

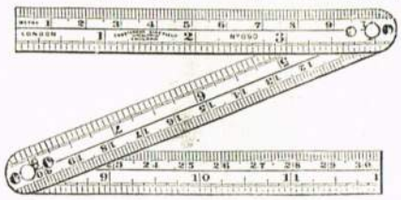

Fig. 538. POCKET STEEL RULES.

Best hardened steel and tempered.

½″ wide × 9/100″ thick, with 4″ lock joints. Marked one side.

No.			Per doz.		Per doz.
853.	Inches to 16, 32, 64ths	12″	**14/–**	24″	**28/–**
836.	,, 16, 32, 64, 20ths	12″	**14/–**		—
830.	,, 16ths, c/m to m/m	12″	**15/–**		—
831.	,, 16, 32, 64ths, c/m to m/m and ½m/m	12″	**16/–**	24″	**32/-**

Fig. 539. STANLEY ALUMINIUM RULES.

Black with raised white letters, rivet joints, six-end folds.

½″ wide.

4 ft., **66/6** 5 ft., **83/3**; 6 ft., **99/9** per doz.

All graduated 1/16 both sides.

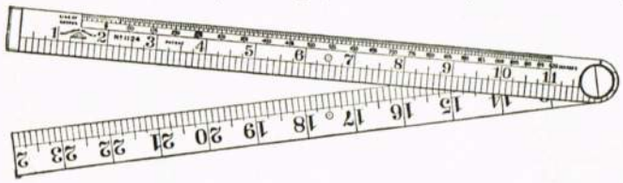

Fig. 540.

CHESTERMAN 2-ft. × 7/8-in. WIDE ×4/100-in. THICK STOP JOINTED RULES.

For measuring or setting out angles to any degree.

No.		Per doz.
1124.	Inches on both sides, 8 and 16ths	**28/-**
1153S.	,, 2 edges, 8, 16, 32, and 64ths	**52/-**
1154S.	,, 4 edges, 8, 16, 32 and 64ths	**60/-**
1158S.	,, 3 edges, 16, 32, 64, 10, 20, 50, 100, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23 and 25ths, tapping and spanner sizes, also m/m and ½m/m on other edge	**72/-**

Fig. 541. JOINTED RULES.

Hardened and tempered. Machine divided, ¾″ × 1/32″. 12″ Stop Joint and N.S. ends.

No.			Per doz.		Per doz.
231.	Inches on both sides into 8ths and 16ths	24″	**20/–**	36″	**33/–**
233.	,, ,, 8, 16, 32, 64ths	24″	**21/–**		—
235.	,, ,, 16, 32, 64ths, c/m into m/m	24″	**24/–**		—
581S.	Inches on 2 edges, 8, 16, 32, 64ths	12″	**33/–**	24″	**46/-**
582S.	,, 4 edges, 8, 16, 32, 64ths	12″	**39/–**	24″	**54/–**
584S.	,, 3 edges, 16, 32, 64, 10, 20, 50, 100, 12, 24, 48, 96ths, and m/m and ½m/m on one edge	12″	**48/–**	24″	**66/–**

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STEEL RULES.

Fig. 542 (No. 350). Brown & Sharpe Stainless Steel Rule.

Stainless Steel

Hardened and Tempered

Graduated $^1/_{64}$″, $^1/_{32}$″, $^1/_{16}$″, $\frac{1}{8}$″. Measures 6″. Price **5/9.** 12″, **11/-.**

The above Rules are made of Stainless Steel, it is rust-proof and will not stain nor discolour.

Fig. 543 (No. 300). Tempered Steel Rules. English Measure.

These Rules are about 1/20″ thick.

Length, inches	1	2	3	4	6	9
Width, inches	$^{29}/_{64}$	$\frac{1}{2}$	$^{35}/_{64}$	$^{19}/_{32}$	$^{11}/_{16}$	$^{53}/_{64}$
No. of graduation	4	4 or 7	4 or 7	4 or 7	1, 2, 4 or 7	4 or 7
Price each	**1/3**	**2/-**	**2/6**	**3/3**	**3/9**	**5/9**
Length, inches	....	12	18	24	36	*48
Width, inches	....	$^{31}/_{32}$	1	1	1	$1\frac{1}{2}$
No. of graduation	....	1, 2, 4 or 7	4 or 7	4 or 7	4 or 7	4 or 7
Price each	....	**7/-**	**10/9**	**13/6**	**29/3**	**41/9**

*Not tempered.

Fig. 544 (No. 303). Narrow Tempered Steel Rule. English Measure.

These Rules are about 1/20″ thick and about 7/32″ wide. Graduated on one corner of each side only.

Length, inches	4	6	9	12
No. of graduations	10	10 11, or 12	10	10, 11, 12
Price each	**3/3**	**3/9**	**5/9**	**7/-**

Fig. 545 (No. 306). Flexible Steel Rules.

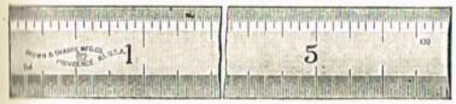
Graduated on one side only.
Can also be had with Metric graduations.

Length, inches	4	6	9	12	18	24
Width, inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
No. of graduations	10	10, 11 or 12	10	10, 11 or 12	10	10
Price each	**3/3**	**3/9**	**5/9**	**7/-**	**10/9**	**13/6**

Furnished with the 64th graduations numbered every eighth graduation line, as 8, 16, 24, etc. This assists the user in quickly ascertaining the number of 64ths in $\frac{1}{8}$″, $\frac{1}{4}$″, $\frac{1}{2}$″, $\frac{3}{4}$″, etc.
Furnished with No. 4 Graduation only.

Fig. 546 (No. 315). Tempered Steel Rules with Figured Graduations.

Length, inches	1	2	3	4	6	9	12	18	24
Width, inches	$^{29}/_{64}$	$\frac{1}{2}$	$^{35}/_{64}$	$^{19}/_{32}$	$^{11}/_{16}$	$^{53}/_{64}$	$^{31}/_{32}$	1	1
Price each	**1/3**	**2/-**	**2/6**	**3/3**	**3/9**	**5/9**	**7/-**	**10/9**	**13/6**



Bevelled on both edges of one side. Graduated on the bevelled edges only.

Fig. 547 (No. 318). Tempered Steel Rules with Bevelled Edges.

Length	2	2	3	4	6	9	12	18	24
Width	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$^{11}/_{16}$	$^{53}/_{64}$	1	1	1
No. of graduations	10 or 11	10 or 11	10 or 11	10 or 11	10 or 11	10 or 11	10 or 11	10 or 11	10 or 11
Price each	**2/-**	**2/9**	**3/6**	**4/3**	**5/-**	**6/3**	**7/6**	**16/3**	**20/**

Parallel lines for key seats, mortices, etc., can be readily and accurately drawn on shafts not less than ½″ in diameter with these rules.
The edges are bevelled. Graduated to 32nds of an inch.

Fig. 548 (No. 374). Key Seat Rules.

Length	4″	6″	8″
Price	**12/6**	**15/-**	**18/9**

Also made graduated in metric.

Metric Rules are graduated to read by half-millimetres, millimetres, or both.

Graduations.

These Rules are divided into parts of an inch, as follows :

No. 1 Graduation.	No. 2 Graduation.	No. 4 Graduation.	No. 7 Graduation.	No. 10 Graduation.	No. 11 Graduation.	No. 12 Graduation.
1st corner, 10 20, 50 100	8	8	16	32	64	50
2nd corner, 12, 24, 48	10, 20, 50, 100	16	32	64	100	100
3rd corner, 14, 28	12, 24, 48	32	64			
4th corner, 16, 32, 64	16, 32, 64	64	100			

All Tempered Steel Rules 2″ to 12″ in length with No. 4 Graduation are furnished with end graduations, reading to 32nds of an inch on two ends of one side. This feature will be found advantageous in measuring the depth and width of grooves, countersinks and recesses of various kinds.

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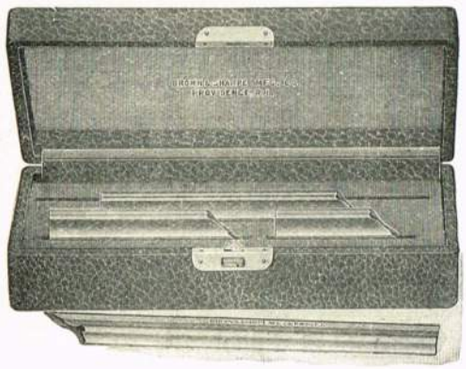
STRAIGHT EDGES.

Bevelled Steel Straight Edges, Fig. 549 (No. 526.)

The bevelled edge is $^1/_{16}$″ thick. Bevelled on one edge only.

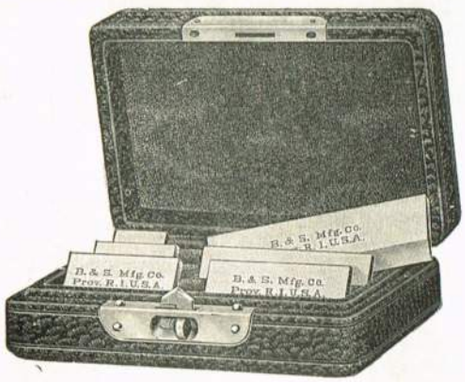
Length, inches	12	18	24	36	48	60	72
Width, inches	$1\frac{3}{8}$	$1\frac{3}{4}$	2	3	3	$3\frac{1}{8}$	$3\frac{1}{8}$
Approx. thickness	$^3/_{16}$	$^3/_{16}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$^9/_{32}$	$^9/_{32}$
Price each	**12/6**	**18/3**	**28/3**	**48/–**	**67/9**	**91/9**	**133/3**

Toolmakers' Knife-Edge Straight Edges, Fig. 551 (Set No. 531)



Price complete in leather case **£5 5 0.**
Consists of glass test bar and 4 straight edges, 1 each—$2\frac{1}{4}$″, $3\frac{1}{4}$″, $4\frac{1}{2}$″ and $6\frac{1}{4}$″ long.

Narrow-Edge Straight Edges, Fig. 553 (Set No. 536)



No. 536. Made of tempered steel, being $^5/_{64}$″ thick and $^9/_{32}$″ wide. Are useful for testing flanged and ball-bearing washers, and are particularly adapted for tool-makers' use for testing surfaces where it would be impossible to use a regular straight edge. The set comprises, $\frac{1}{2}$″, $\frac{3}{4}$″, 1″, $1\frac{1}{4}$″ $1\frac{1}{2}$″ 2″.
Price, set complete in morocco case **18/9.**

Fig. 555 (No. 387.) Bevelled Starrett Straight Edge.

Graduated on bevelled edge only in 32nds of an inch.

Length, inches	12	18	24	36	48
Wide, inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Thick, inches	$^3/_{16}$	$^3/_{16}$	$^3/_{16}$	$\frac{1}{4}$	$\frac{1}{4}$
Price each	**12/6**	**19/3**	**26/–**	**43/9**	**73/-**

Hardened Steel Straight Edges, Fig. 550 (No. 527.)

These straight edges are like the tongues of our hardened steel try squares, and are hardened on the edges only. Made from the best quality of steel and with every care taken to insure their being straight.

Length, inches	$3\frac{7}{8}$	$5\frac{1}{2}$	7	$10\frac{3}{4}$	$13\frac{3}{4}$
Width, inches	$^{15}/_{16}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{3}{4}$	$2^1/_{16}$
Approx. thickness, inches	$^1/_{16}$	$^5/_{64}$	$^5/_{64}$	$^5/_{64}$	$^5/_{64}$
Price each	**4/3**	**6/3**	**7/3**	**12/6**	**16/9**
Length, inches	17	20	27	30	39
Width, inches	$2^7/_{16}$	$2\frac{7}{8}$	3	$3\frac{1}{4}$	$3\frac{5}{8}$
Approx. thickness, inches	$^5/_{64}$	$^5/_{64}$	$^5/_{64}$	$\frac{1}{8}$	$\frac{1}{8}$
Price each	**25/–**	**29/3**	**37/6**	**50/–**	**62/6**

Fig. 552 Standard Steel Straight Edges, (No. 528.)

Differ from Straight Edges No. 527 only in their dimensions and in not being hardened.

Length, inches	6	9	12	18	24
Width, inches	1	$1^1/_{16}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Approx. thickness, inches	$^5/_{64}$	$^5/_{64}$	$^5/_{64}$	$^3/_{32}$	$^3/_{32}$
Price each	**3/3**	**5/3**	**7/3**	**11/6**	**16/9**
Length, inches	....	36	48	60	72
Width, inches	....	$2\frac{1}{2}$	3	3	3
Approx. thickness, inches		$^7/_{64}$	$^7/_{64}$	$\frac{1}{8}$	$\frac{1}{8}$
Price each	....	**27/–**	**45/9**	**63/9**	**91/9**

Toolmakers' Knife-Edge Straight Edges (No. 530.)

For work that requires extreme accuracy. They are made from the best quality of steel, and every care is taken to ensure their being straight and true.

Length, inches	$2\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{1}{2}$	$6\frac{1}{4}$
Width, inches	$^{13}/_{16}$	$^{13}/_{16}$	$^{13}/_{16}$	$^{13}/_{16}$
Price each	**13/9**	**18/9**	**23/9**	**35/–**

The above Straight Edges are furnished in cloth-covered cases.

Test bar, in cloth covered case .... Price	**20/–**
Leather case for complete set	**5/3**
Cloth-covered case for test bar	**1/3**
Cloth-covered case for single straight edge	**1 3**

Fig. 554 (No. 380.) Starrett Straight Edge.

Are not graduated. Made in pairs when two are wanted of exactly the same width. Prices are for a single straight edge.

Length, nches	12	18	24	66	48	60	72
Wide, inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	3
Thickness, inches	$^3/_{16}$	$^3/_{16}$	$^3/_{16}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Price each....	**6/3**	**10/–**	**13/9**	**25/–**	**40/–**	**60/–**	**80/–**

Fig. 556 (No. 385.) Starrett Bevelled Straight Edge.

Length, inches	12	18	24	36	48	60	72
Wide, inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	3
Thickness, inches	$^3/_{16}$	$^3/_{16}$	$^3/_{16}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Price each....	**8/6**	**13/9**	**18/9**	**30/–**	**50/–**	**75/–**	**100/–**

One edge only is bevelled, and this to $^1/_{16}$″ thick from $\frac{1}{2}$″—$\frac{5}{8}$″ back.

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RULES.

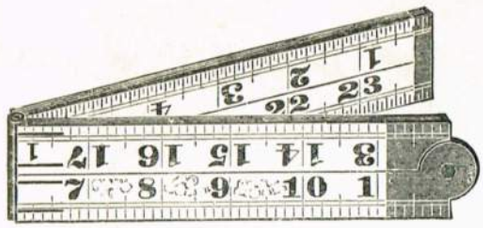

Fig. 570. "Eesesee" Boxwood Carpenters' Rules.
With bold black figures. Graduated in $^1/_{16}$ths and $\frac{1}{8}$ths of an inch. Square joint. $1\frac{3}{8}''$ wide.
2 ft. ... **13/8** per doz. 3 ft. ... **16/6** per doz.

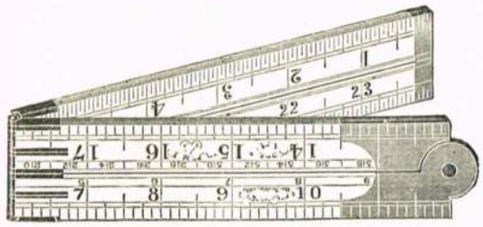

Fig. 572. Arched Joint Boxwood 2 ft. Rules.
Graduated in $^1/_{16}$ths and $\frac{1}{8}$ths of an inch. $1''$ wide.
Price ... **8/3** per dozen.

Fig. 573 As above, but heavier. $1\frac{1}{8}''$ wide. 3 ft. rule.
Price ... **13/6** per dozen.

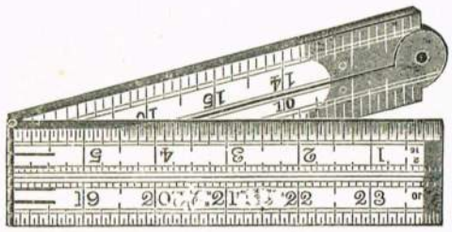

Fig. 576. 2 ft. 4-fold Boxwood Rules.
Extra strong joints. Marked $\frac{1}{4}$ths and $\frac{1}{8}$ths of an inch. Brass pin holes. One leg bevelled on outside. Angles on joints. $1\frac{1}{8}''$ wide.
Price ... **12/6** per dozen.

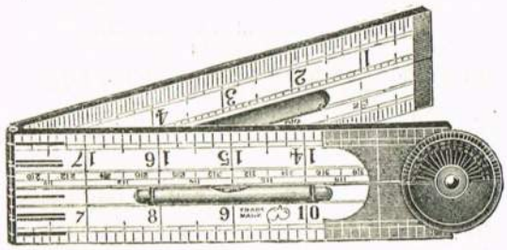

Fig. 578. 2 ft. 4-fold Boxwood Rules with Spirit Levels.
Brass pin holes. Graduated $\frac{1}{8}$ths, $^1/_{16}$ths, $^1/_{10}$ths. Two scales. Brass tips and degrees on brass plates.
Price, 2 ft. ... **36**/– per dozen.

Fig. 579. As above, but with brass-bound edges, and $1\frac{1}{2}''$ wide.
Price, 2 ft. ... **46/9** per dozen.

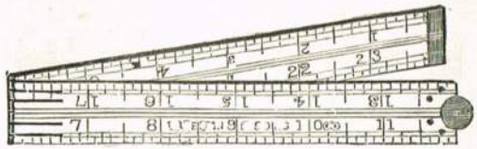

Fig. 571. French Polished Boxwood 2 ft. 4-fold Rules.
Graduated in $^1/_{16}$ths and $\frac{1}{8}$ths of an inch. $1''$ wide.
Price ... **5/9** per dozen.

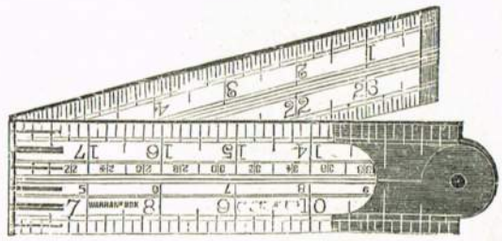

Fig. 574. Arch Joint Boxwood Rule.
Graduated in $^1/_{16}$ths and $\frac{1}{8}$ths of an inch and scales. $1\frac{1}{2}''$ wide.
Price, 2 ft. ... 12/9 per doz. 3 ft. ... **15/6** per doz.

Fig. 575. Arch Joint 2 ft. 4-fold. Brass-bound edges. Marked $\frac{1}{8}$ths, $^1/_{16}$ths, $^1/_{10}$ths, $^1/_{12}$ths of an inch. $1\frac{1}{8}''$ wide. **17/6** per doz.

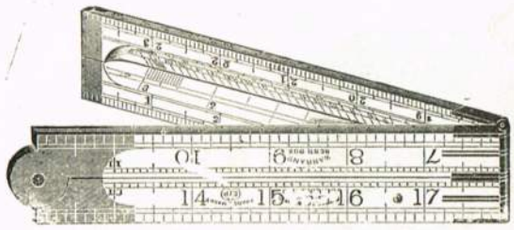

Fig. 577. 2 ft. 4-fold Boxwood Rules.
$1\frac{1}{8}''$ wide. Brass edge plates. Bevelled edges. With eight scales. Graduated $\frac{1}{8}$ths, $^1/_{16}$ths, $^1/_{10}$ths and $^1/_{12}$ths.
Price ... **26/3** per dozen.

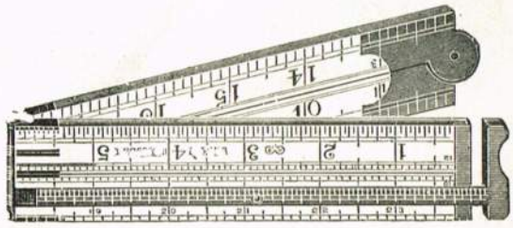

Fig. 580. Boxwood Rule and Caliper Gauge.
Arch joint. Marked $^1/_{16}$ths, $\frac{1}{8}$ths, $^1/_{10}$ths, $^1/_{12}$ths of an inch. $1\frac{1}{8}''$ wide.
Price ... **29/3** per dozen.

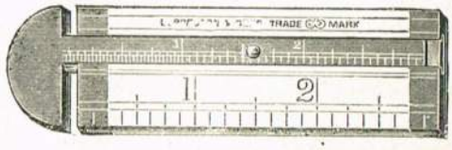

Fig. 581. One foot $3''$ long × $1''$ wide **Caliper Gauge.**
11/3 per dozen.

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TAPE MEASURES.

Fig. 582. WIND-UP MEASURES WITH STEEL TAPES.

Marked on one or both sides. ¼″ wide Steel Tapes.

No.	Length	3	4	5	6 feet.
198SS.	Brass case	**30/–**	**36/–**	**40/–**	**46/–** per doz.
36SS.	German silver case	**36/–**	**42/–**	**48/–**	**54/–** ,,

Fig. 583. WIND-UP MEASURES WITH STEEL TAPES.

With four measurements (two on each side).
With Steel Tapes ⅜″ wide.

No.		Length	3	4	5	6	feet
202SS.	Brass case	....	**36/–**	**42/–**	**48/–**	**56/–**	,,
195SS.	German silver case	....	**42/–**	**48/–**	**56/–**	**63/–**	,,

Fig. 553a. WIND-UP MEASURES WITH LINEN TAPES.

With four measurements (two on each side).
With Linen Tapes ⅜″ wide.

No.		Length	3	4	5	6	feet.
29½	Brass case	....	**29/–**	**32/–**	**35/–**	**38/–**	per doz.
185SS.	German silver case	....	**34/–**	**38/–**	**42/–**	**45/–**	,,

No. 1526.

Fig. 584. WIND-UP MEASURES WITH PATENT BEST WOVEN LINEN TAPES.

This Tape is woven on a patent principle, which makes it less liable to shrink than any other woven tape. It is made in three different widths, viz., ⅜ in., ½ in., and ⅝ in., but we recommend the ⅝ in. as the most serviceable one. All Wind-up Measures are fitted with the " folding " handle, which is the cheapest, or the new patent " flush " handle, which is convenient for carrying in the pocket, and is a great advance on anything that has yet appeared in the market. They are also fitted with a **Patent Eyelet Attachment,** which prevents the screws at the back of the case from working loose and falling out. The Tapes are all special weaving, the quality being the best of its kind, and to obtain the *maximum* of strength in the *minimum* of space, are made of the very best quality of yarn. We confidently recommend this as the **best woven** Tape made.

Marked ON BOTH SIDES (One measurement each side of Tape).

			10		15	20		25	30 metres.
	With FOLDING Handle ...	25	33	40	50	66	75		100 feet.
No. **1526**	Leather Case, ⅝ in. Tape ...	**4/7**	**5/3**	**5/9**	**6/6**	**7/6**	**8/3**	**8/11**	**10/6** each.
,, **1528**	Hard Leather Case, ⅝ in. Tape	**5/10**	**6/6**	**7/–**	**7/9**	**9/–**	**9/9**	**10/5**	**12/–** ,,
	With FLUSH Handle.								
,, **1527**	Leather Case, ⅝ in. Tape ...	**5/1**	**5/9**	**6/3**	**7/–**	**8/3**	**9/–**	**9/8**	**11/6** ,,
	Tapes only (refills for Cases)—								
,, **2801**	⅝ in. wide	**2/2**	**2/9**	**3/3**	**3/9**	**4/6**	**5/–**	**5/7**	**7/3** ,,

No. 1527.

Fig. 585. WIND-UP MEASURES WITH PATENT METALLIC TAPES.

No. 34L.

No.	Case	Handle	Width of Tape	— 25	10 33	— 40	15 50	20 66	— 75	25 —	30 metres. 100 feet.
34L.	Leather	Folding	⅝″	**4/7**	**5/3**	**5/9**	**6/6**	**7/6**	**8/3**	**8/11**	**10/6** each.
34H.	,,	Flush	⅝″	**5/1**	**5/9**	**6/3**	**7/–**	**8/3**	**9/–**	**9/8**	**11/6** ,,
147.	Hard	Folding	⅝″	**5/10**	**6/6**	**7/–**	**7/9**	**9/–**	**9/9**	**10/5**	**12/–** ,,
148.	,,	Flush	⅝″	**6/4**	**7/–**	**7/6**	**8/3**	**9/9**	**10/6**	**11/2**	**13/–** ,,
126.	Tape only	....	⅝″	**2/2**	**2/9**	**3/3**	**3/9**	**4/6**	**5/–**	**5/7**	**7/3** ,,
172.	Leather	Folding	½″	**4/4**	**5/–**	**5/6**	**6/–**	**7/–**	**7/9**	**8/4**	**9/9** ,,
173.	,,	Flush	½″	**4/10**	**5/6**	**6/–**	**6/6**	**7/9**	**8/6**	**9/–**	**10/9** ,,
2800.	Tape only	....	½″	**2/–**	**2/6**	**3/–**	**3/6**	**4/–**	**4/6**	**5/–**	**6/8** ,,

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TAPE MEASURES.

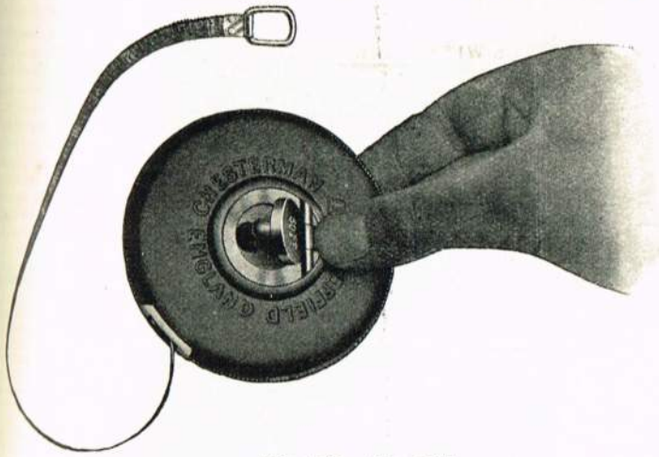

Fig. 586. No. 1515.

Fig. 587. No. 38L.

1515 WIND-UP MEASURES WITH STEEL TAPES, ¼ in. wide. 50 ft. sizes weigh on 6¼ ozs. Leather Case.

	Size		10		15	20 metres.
		25	33	40	50	66 feet.
Marked one side feet, inches, and 16ths, or feet in 100ths		**9/–**	**10/6**	**12/–**	**13/6**	**17/–** each.
Marked as above and with links and poles on back		**9/6**	**11/–**	**12/6**	**14/6**	**18/–** ,,
Marked one side only into centimetres and millimetres		—	**11/–**	—	**14/6**	**18/–** ,,
Marked any two measurements (one on each side)		**10/6**	**12/6**	**14/–**	**17/–**	**22/–** ,,

No. 38L. WIND-UP MEASURES WITH STEEL TAPES, ⅜ in. wide, in Leather Case.

	Size		10		15	20		25	30 metres.
		25	33	40	50	66	75	—	100 feet.
Marked one side only, feet, inches, and 8ths, or feet into 100ths ...		**10/–**	**11/6**	**13/–**	**15/–**	**19/–**	**21/–**	—	**26/–** each.
Tape only		**6/–**	**7/6**	**9/–**	**10/–**	**14/–**	**16/–**	—	**21/–** ,,
Marked, as above, with links and poles on back		**11/–**	**13/–**	**15/–**	**17/6**	**22/–**	**25/–**	—	**31/–** ,,
Tape only		**7/–**	**9/–**	**11/–**	**13/–**	**17/–**	**20/–**	—	**26/–** ,,
Marked on side only into Centimetres and Millimetres		—	**13/–**	—	**17/6**	**22/–**	—	**27/–**	**31/–** ,,
Tape only		—	**9/–**	—	**13/–**	**17/–**	—	**22/–**	**26/–** ,,
Marked with any two measurements, one on each side		**13/–**	**15/–**	**17/6**	**21/–**	**27/–**	**29/–**	**32/6**	**38/–** ,,
Tape only		**9/–**	**11/–**	**13/6**	**16/6**	**22/–**	**24/6**	**27/6**	**33/–** ,,

Fig. 588. No. 2108. PATENT STEEL BAND MEASURING CHAIN.

Equal, strength, greater correctness, is easier to clean and to coil or uncoil, very much lighter, and more compact than Chain.

These prices are for Measuring Bands, supplied coiled on a steel Cross, as illustration, but can be supplied in metal case at the following extras :—**4/–** for ½ in. wide and **6/–** for ⅝ in. and ¾ in wide.

No. **2108**	Divided into links and numbered every 10 links.	Width ½	2 poles **8/6**	4 poles **13/6**	each.			
,, **2109**	,, ,, 10 ,,	,, ⅝	2 poles **10/6**	4 poles **18/–**	,,			
,, **2110**	,, ,, 10 ,,	,, ¾	2 poles **11/6**	4 poles **20/–**	,,			
,, **2112**	Divided into feet and numbered every 10 feet last feet into 10ths or 12ths.	,, ⅝	50 feet **13/–**	100 feet **22/–**	each.			
,, **2119**	Etched feet, inches, & ⅛th one side links other side	Width ½	33 feet **12/–**	50 feet **17/–**	66 feet **21/–**	100 feet **30/–**	each.	
,, **2120**	,, ,, ⅛th ,, ,,	,, ⅝	33 feet **14/–**	50 feet **21/–**	66 feet **26/–**	100 feet **35/–**	,,	
,, **2121**	,, ,, ⅛th ,, ,,	,, ¾	33 feet **16/–**	50 feet **24/–**	66 feet **35/–**	100 feet **44/–**	,,	
,, **2232**	Divided at every 5th of metre and numbered at every 2nd metre.	Width ⅝	10m. **10/6** ;	20m. **18/–** ; 50m. **39/–**	25m. **21/6** ;	30m. **25/–** ;		
,, **2233**	,, ,, 5th ,, ,, 2nd ,, ,,	¾	10m. **11/6** ;	20m. **20/–** ; 50m. **44/–**	25m. **24/–** ;	30m. **28/–** ;		

,, **2347** Etched feet, inches and 8ths on one side, and millimetres on the other side.

¾ in. wide — 33 feet / 10 metres **20/–** — 50 feet / 15 metres **28/–** — 66 feet / 20 metres **36/–** — 25 metres **44/–** — 100 feet / 30 metres **53/–** — 50 metres **80/–** each.

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LEVELS AND LAND CHAINS.

Fig. 590. FRENCH POLISHED SPIRIT LEVELS.

Warranted, with best proved tubes.

Light Quality.

Brass plated top and tipped bottom.

Size, inches ...	6	8	10	12
Price per doz. ...	**9/–**	**11/3**	**14/3**	**17/–**

Heavy Quality. As above.

Size, inches ...	6	8	9	10	12	14
Price per doz. ...	**11/6**	**14/–**	**15/9**	**17/6**	**19/6**	**22/6**

Fig. 591. FRENCH POLISHED ROSEWOOD SPIRIT LEVEL,

With plumb and level. Tapered ends.
Brass plated tops and tipped bottoms.

Size	6	9	10	12
Price per dozen	**17/–**	**20/–**	**22/–**	**26/–**

Fig. 592. IRON ENGINEERS' NICKEL-PLATED POCKET LEVEL.

4″ ... **18/–** per dozen.

Fig. 593. LAND CHAIN ARROWS.

15″ long, in sets of 10.

Made of best steel wire, hardened, tempered, and black enamelled.

No.		Per set.
255	Best No. 10 steel wire ...	**1/6**
259	,, 8 ,,	**1/9**
1030	,, 7 ,,	**2/–**
1031	,, 6 ,,	**2/3**
1032	Steel spindle arrows (about $13'' \times {}^{3}/_{32}''$)	**2/–**
	Made of best iron wire.	
256	Best No. 7 iron wire ...	**1/–**
257	,, 6 ,,	**1/2**

Fig. 594. LAND CHAINS.

The 2 and 4 pole chains are divided into links, and tallied at every 10 links. The 50 and 100 feet chains are divided into feet, and tallied at every 10 feet.

Made of best iron wire, with three oval rings, brass swivel handles and tallies.

No.		2 poles	4 poles	50 feet	100 feet
256	No. 7 W.G. ...	**6/–**	**9/–**	**6/9**	**10/6** each
62	No. 8 W.G. ...	**5/9**	**8/6**	**6/6**	**9/6** ,,
251	No. 9 W.G. ...	**5/–**	**7/6**	**5/6**	**8/6** ,,

Made of best iron wire, with two oval rings, brass swivel handles and tallies.

No.		2 poles	4 poles	50 feet	100 feet
254	No. 7 W.G. ...	**5/3**	**8/–**	**6/–**	**9/–** each
62½	No. 8 W.G. ...	**5/–**	**7/6**	**5/6**	**8/6** ,,
252	No. 9 W.G. ...	**4/3**	**6/9**	**5/–**	**8/–** ,,

Made of best steel wire, hardened, tempered, and black enamelled, with three oval rings, brass swivel handles and tallies.

No.		2 poles	4 poles	50 feet	100 feet
258	No. 8 W.G. ...	**8/6**	**15/–**	**10/–**	**18/–** each
1017	No. 10 W.G. ...	**7/3**	**13/6**	**8/6**	**16/–** ,,
61	No. 12 W.G. ...	**6/6**	**12/–**	**7/6**	**14/–** ,,

Made of best steel wire, hardened, tempered and polished. Two oval rings, brass swivel handles and tallies.

No.		2 poles	4 poles	50 feet	100 feet
1015	No. 12 W.G. ...	**6/–**	**11/–**	**6/6**	**12/–** each
1010	No. 12 W.G., all joints brazed ...	**10/6**	**19/–**	**11/–**	**20/–** ,,

Made of best steel wire, hardened, tempered, and polished. Three oval rings, brass swivel handles and tallies.

No.		2 poles	4 poles	50 poles	100 feet
1015	No. 10 W.G. ...	**6/6**	**12/–**	**8/–**	**15/–** each
1016	No. 12 W.G. ...	**6/–**	**11/–**	**7/–**	**13/–** ,,
1011	No. 12 W.G., all joints brazed ...	**11/–**	**21/–**	**12/–**	**23/–** ,,

Any of the foregoing may be had with all the joints brazed, so as to make a solid chain.

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STANLEY LEVELS. Etc.

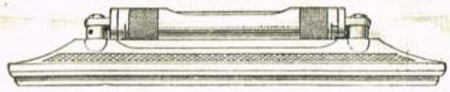


Fig. 600. (No. 34—G).

"ECLIPSE" LEVELS, No. 34 G.

These Levels have a **V**-grooved base for use on shafting, etc. The outer shell can be turned so as to cover the glass completely. They are nickel-plated and have ground glasses.

Sizes, inches	4	6	8	10
Price each	**6/11**	**8/8**	**11/8**	**12/10**

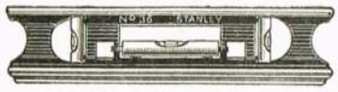


Fig. 601. (No. 36G. 12″).

METALLIC PLUMBS AND LEVELS, No. 36 G.

The tops and bottoms of these levels are milled and wet ground to ensure two perfectly parallel surfaces. The bases are furnished with **V**-grooves, for use when working on piping, shafting, etc.

Sizes, inches long	6	9	12	18	24
Price each	**8/–**	**9/7**	**11/5**	**13/8**	**15/6**

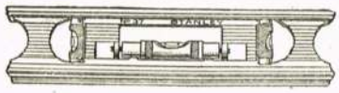


Fig. 602. (No. 37G. 12″).

No. 37G.

These Levels are similar to No. 36 except that they are fully nickel-plated and are fitted with ground glasses.

Size, inches long	6	9	12	18	24
Price each	**11/2**	**13/4**	**15/4**	**18/6**	**21/6**

"VICTOR" IRON LEVELS, Nos. 38½ and 39½.

Fig. 603. (No. 39½).

These Levels are fitted w th proved glasses which are set solid in plaster. The solid brass top-plate is entirely separate from the glass and is secured to the body of the level by means of machine screws. They are nickel-plated and have proved glasses.

No. 38½.	4″ long	**3/2**	each
No. 39½.	6″ long	**3/11**	each

Fig. 604. (No. 2). Hardwood Level.

Fig. 604. (No. 3.) Hardwood with Brass Tips.

WOOD LEVELS, Nos. 2 and 3.

Hardwood Plumb and Level, square top-plate, two brass-lipped side views, 30″ long.

PRICES:

No. 2.	Hardwood, with ground glasses	**9/–**	each
No. 3.	,, ,, ,, and brass tips ...	**10/11**	,,

Fig. 605. PROVED GLASSES.

All Stanley Plumb and Level Glasses are made of extra thick tubing.

By a patented process the two lines that define the limits of the bubble when the glass is level are indelibly marked on the convex or high side of the curve, at points equi-distant from its centre or crowning point.

The glass so marked is said to be "proved" because its convex or high side has been accurately determined.

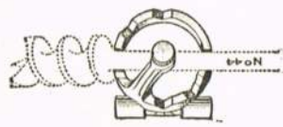
The two indelible lines not only enable the user to very quickly and accurately centre the bubble, but they also make it easy for any carpenter or mechanic to set a new glass with the convex or high side uppermost, a condition absolutely necessary to the accuracy and efficiency of his level.

Length, inches	1	1¼	1½	1¾	2	2¼	2½	3	3½	4	4½
Price per dozen	**5/1**	**5/1**	**5/1**	**5/1**	**5/9**	**6/–**	**6/5**	**6/11**	**7/4**	**9/–**	**9/4**

Fig. 606. STANLEY BIT AND SQUARE LEVEL (No. 44).

No. 44.

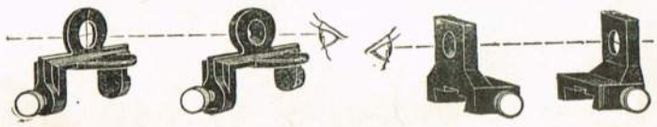
No. 44.



This tool has three pairs of **V** slots on its back edges. The shank of a bit will lie in these slots, either vertical or at an angle of 45 degrees, and boring can be done with perfect accuracy. It can also be attached to a carpenter's square, making it an accurate Plumb or Level.

Brass frame ... ... **2/4** each.

Fig. 607. LEVEL SIGHTS (Nos. 1 and 2).



These sights can be attached to any level for levelling at long distances. When not in use the level sights are easily detached.

No. 1.	For wood levels, japanned ...	**5/6**	per pair
No. 2.	For iron levels, ,, ...	**5/6**	,,

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STARRETT LEVELS.

Fig. 608. (No. 130).

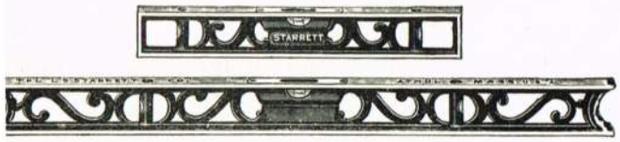

Fig. 609. (No. 132).
Bench Levels with Double Plumbs.

Fig. 610. (Nos. 95 and 96 Pattern).
4″, 6″ and 8″ sizes.

Fig. 611. (Nos. 97 and 98 Pattern).
12″ size. The 18″ size is similar, but with double plumb.

Fig. 612. (No. 133).

Fig. 613. (No. 135).

Fig. 614. (No. 134).

IRON BENCH LEVELS, No. 130.

Price—3½″ ... ... **2/6**.

No. 132. With Double Plumbs.

These levels have a longitudinal groove in seat of frame, adapting them to rest on cylindrical as well as flat surfaces.

4″, square ends	...	**7/–**	12″, square ends	...	**8/9**
6″ ,,	...	**7/6**	18″, concave ends	...	**12/6**
9″ ,,	...	**8/6**	24″ ,,	...	**14/9**

ADJUSTABLE BENCH LEVELS.

With Ground and Graduated Vials.

These levels can be accurately adjusted and are not liable to get out of truth, the vials being set in tubes having solid ends, firmly clamped to the base. The outer tube may be turned so as to protect the glass when not in use. These levels have the longitudinal groove mentioned above. The tubes are plated.

No. 95.
With Plain Vial.

Sizes,	Nos.	95	96
4″	...	**7/6**	**13/9**
6″	...	**8/6**	**16/9**
8″	...	**9/6**	**18/9**

No. 96.
With Ground and Graduated Vial.

Sizes	Nos.	95	96
12″, with plumb	...	**13/9**	**27/3**
18″ double plumb	...	**17/9**	**37/6**

All bottoms ground true.

IMPROVED LEVELS.

For Testing Shafting, etc.

Similar to Nos. 95 and 96, but with cross level, which enables one to place or hold the base on a shaft level in its cross section.

No. 97.
With Plain Vial.

Sizes,	Nos.	97	98
6″	...	**9/6**	**17/9**
8″	...	**11/6**	**21/–**

No. 98.
With Ground and Graduated Main Vial.

Sizes,	Nos.	97	98
12″, with plumb	...	**15/9**	**41/9**
18″, double plumb	...	**22/–**	**41/9**

ENGINEERS' AND PLUMBERS' LEVELS, No. 133.

This is an adjustable incline level, a fixed level, and a plumb. The hinged tube inside the working faces of the frame, carrying a level glass, is adjustable to the graduated scale, and shows any incline by 32nds (or less) to 2″ to the foot without interfering in the least with the plumb or level. **V** groove in base. Supplied with either ground or plain glasses.

*10″, plain glasses,	...	**14/9**	10″, ground glasses	...	**29/3**
15″, ,,	...	**15/9**	15″, ,,	...	**30/3**

*This style sent unless otherwise ordered.

Also supplied to Metric sizes at same prices as above.

POCKET LEVELS, No. 135.

Nickel-plated.

Prices—2½″, **2/3**; 3½″, **2/6**.

CROSS-TEST LEVEL AND PLUMB, No. 134.

This is valuable in plumbing, squaring, and levelling up work. Levelling is indicated every way without moving the tool. It weighs 3 ozs. Size 2″×3″×½″ thick. Can be easily carried in the pocket.

Price, nickel plated **7/6**

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BROWN & SHARPE COMBINATION SQUARES.

The following squares and centre heads are drop forged and superior to those of cast iron. This feature is readily appreciated by mechanics, as it contributes much to the lightness, durabil:ty and convenience of the tool.

In the Protractors, the revolving turret which carries the blade is fitted to a nicety and accurately graduated, being engine divided to 90° either side of zero, and every care taken to insure the zero being at right angles to the face of the head. It can be set at any angle and rigidly clamped by a thumb nut.

An important feature is the round clamping groove in the blade. This allows the head to be quickly clamped and forces the blade against the side of the slot square with the face of the head. It also admits the use of a stronger blade and clamping bolt than does the usual square groove and presents no sharp corners to collect dirt and impair the accuracy of the tool.

Parallel lines running lengthwise of the blade are provided to aid in reading the various parts of an inch. The levels, which are such important adjuncts to tools of this kind, are accurately set and fastened to the side of the turret and in a protected position on the square head.

Another important feature is that all parts of these squares are made interchangeable, thus allowing repairs to be made by simply ordering the part needed and avoiding the necessity of returning the tool.

The blades are furnished tempered as listed and are graduated with extreme care and accuracy.

GRADATIONS OF BLADES OF B. & S. PROTRACTORS.

	No. 1.	No. 2.	No. 4.	No. 7.
1st corner	10, 20, 50, 100	8	8	16
2nd corner	12, 24, 48	10, 20, 50, 100	16	32
3rd corner	14, 28	12, 24, 48	32	64
4th corner	16, 32, 64	16, 32, 64	64	100

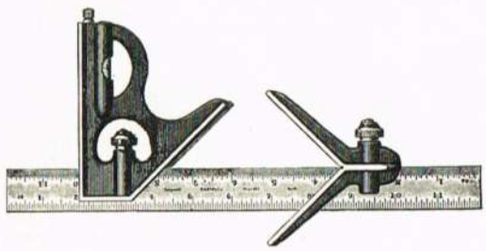

Fig. 615. (Nos. 400/410).

Combination Squares, Nos. 400, 402, 408, 410.

With Hardened Heads. No.	Size. inches.	Price. £ s. d.	With Soft Heads. No.	Size. inches.	Price. £ s. d.
	6	0 16 3		6	0 10 0
400	9	0 18 9	402	9	0 12 6
English	12	1 0 0	English	12	0 15 0
	18	1 5 0		18	0 18 9
	24	1 7 6		24	1 2 6
	c/m.			c/m.	
	15	0 16 3		15	0 10 0
408	20	0 18 9	410	20	0 12 6
English	30	1 0 0	English	30	0 15 0
and	50	1 5 0	and	50	0 18 9
Metric	60	1 7 6	Metric	60	1 2 6

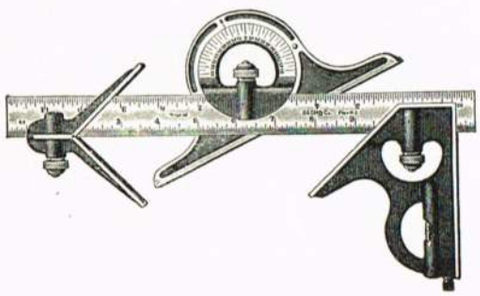

Fig. 616. (Nos. 425/436).

Level is on Reverse Side of Head.

Combination Sets, Nos. 425, 426, 435, 436.

With Hardened Square and Centre Heads. No.	Size. inches.	Price. £ s. d.	With Soft Heads. No.	Size inches.	Price. £ s. d.
	9	1 11 3		9	1 5 0
425	12	1 12 6	426	12	1 9 0
English	18	1 17 6	English	18	1 11 3
	24	2 0 0		24	1 15 0
435	c/m.		436	c/m.	
English	50	2 15 0	English	50	2 12 6
and Metric	60	3 0 0	and Metric	60	2 15 0

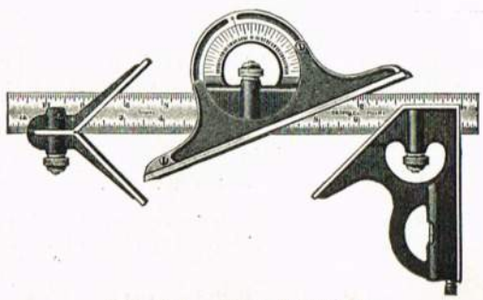

Fig. 617. (Nos. 438/447).

Level is on Reverse Side of Head.

Combination Sets, Nos. 438, 439, 446, 447.

with Reversible Protractor Head.

With Hardened Square and Centre Heads. No.	Size. inches.	Price. £ s. d.	With Soft Heads. No.	Size. inches.	Price. £ s. d.
	9	1 16 3		9	1 10 0
438	12	1 17 6	439	12	1 11 3
English	18	2 2 6	English	18	1 16 3
	24	2 5 0		24	2 0 0
	c/m.			c/m.	
	20	1 16 3		20	1 10 0
446	30	1 17 6	447	30	1 11 3
English	50	2 2 6	English	50	1 16 3
and Metric	60	2 5 0	and Metric	60	2 0 0

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BROWN & SHARPE PROTRACTORS.

Level is on reverse side of head.

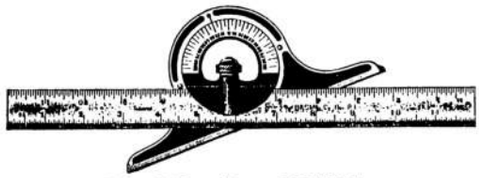

Fig. 618. (Nos. 450/454).

Protractor Nos. 450, 454.

No.	Size.	Price.
	9 in.	£0 18 9
450	12 in.	£1 1 3
English	18 in.	£1 5 0
	24 in.	£1 8 9
	20 c/m.	£0 18 9
454	30 c/m.	£1 1 3
English and Metric	50 c/m.	£1 5 0
	60 c/m.	£1 8 9

Level is on reverse side of head.

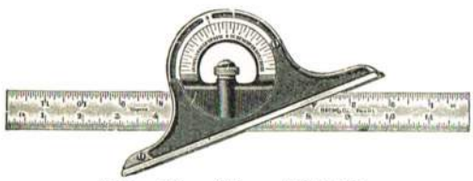

Fig. 619. (Nos. 456/460).

Protractor Nos. 456, 460.

with Reversible Protractor Head.

No.	Size.	Price.
	9 in.	£1 2 6
456	12 in.	£1 3 9
English	18 in.	£1 8 9
	24 in.	£1 11 3
	20 c/m.	£1 2 6
460	30 c/m.	£1 3 9
English and Metric	50 c/m.	£1 8 9
	60 c/m.	£1 11 3

SPARE PARTS FOR COMBINATION SQUARES, SETS, AND PROTRACTORS.

Size—inches	4 in.	6 in.	9 in.	12 in.	18 in.	24 in.
Size—metric, c/m.	10 c/m.	15 c/m.	20 c/m.	30 c/m.	50 c/m.	60 c/m.
Blades, Tempered	**3/9**	**5/-**	**6/3**	**8/-**	**12/6**	**16/3** each
Soft Heads	**5/-**	**6/3**	**6/3**	**8/-**	**8/-**	**8/-** each
Hardened Heads	**6/3**	**8/9**	**8/9**	**10/-**	**10/-**	**10/-** each
Soft Centre Heads	--	**5/-**	**6/3**	**6/3**	**6/3**	**6/3** each
Hardened Centre Heads	—	**6/3**	**8/-**	**8/-**	**8/-**	**8/-** each

Scribers, **9**d. each. Level Glasses, **9**d. each.

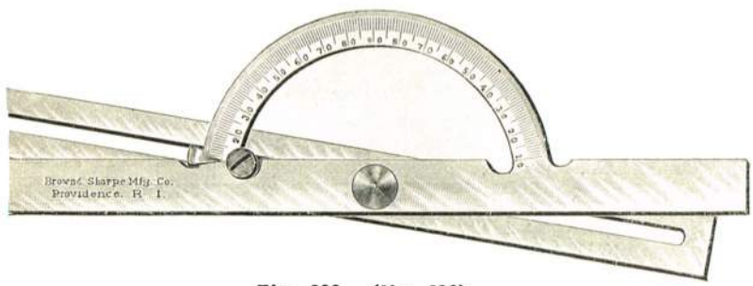

Fig. 630. (No. 492).
The half-circle is divided into degrees.

No. 492. Bevel Protractor.

Number.	Length of Sliding Arm, Inches.	Price.
492	6	£2 1 9
492	10	£2 3 9

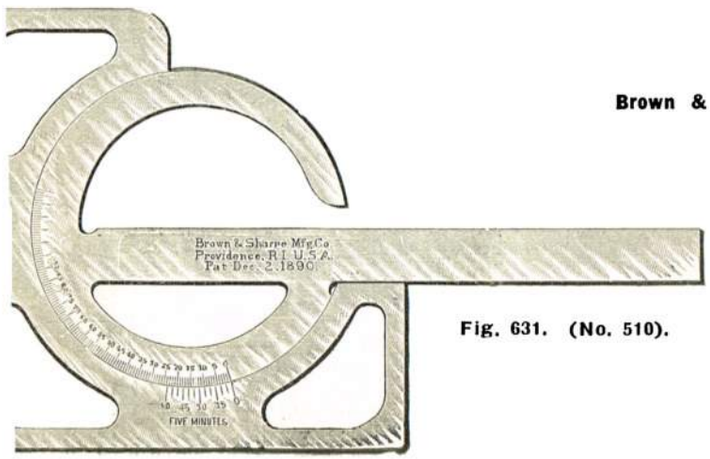

Fig. 631. (No. 510).

Brown & Sharpe No. 510 Draughtsmen's Protractors.

Can be quickly set to any angle, used either side up and on either of the two outside edges of the frame. It can be used to advantage in dividing a circle, transferring angles or laying off a given angle, without re-setting, on either side of a line.

The Vernier reads to five minutes.

This Protractor forms a convenient extension of a T square and frequently takes the place of 45° and 60° angles.

Price, **£2 1 9**, in morocco case, **£2 12 0**.

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STARRETT SQUARES BEVEL PROTRACTORS.

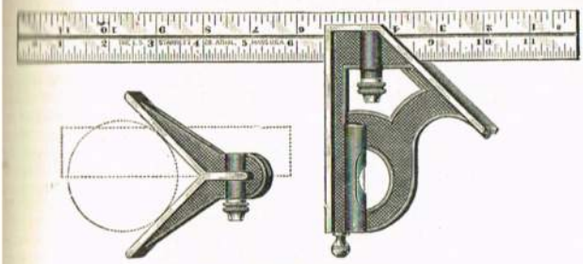

Fig. 632. (No. 11).

Combination Square No. 11.

With hardened blade rule.

The blades are graduated in No. 4 and No. 7 graduations. No. 4 sent unless otherwise ordered.

Every tool warranted accurate, adjustable blade, depth gauge, mortise and mitreing. The auxiliary centre head forms a centreing square for inside and outside work.

Size.		
4″,	without centre head, and has no level	**6/3**
6″,	with centre head fitted and level	**10/–**
9″,	,, ,, ,, ,, ...	**12/6**
12″,	,, ,, ,, ,, ...	**15/–**
18″,	,, ,, ,, ,, ...	**18/9**
24″,	,, ,, ,, ,, ...	**22/6**

No. **11M.** Same as above, but in metric, graduated 10–60 c/m., all with centre head. Prices: 10 c/m, **8/9**; 15 c/m, **10/–**; 20 c/m, **12/6**; 30 c/m, **15/–**; 50 c/m, **18/9**; 60 c/m, **22/6.**

No. **11 M.** & **E.** As above, but English and metric graduated on one side. Same prices as No. **11 M.**

COMBINATION SQUARE, No. **33.** As No. **11,** but with hardened blade and hardened head. All with centre head. 6″, **16/3**; 9″, **18/9**; 12″, **20/–**; 18″, **25/–**; 24″, **27/6.**

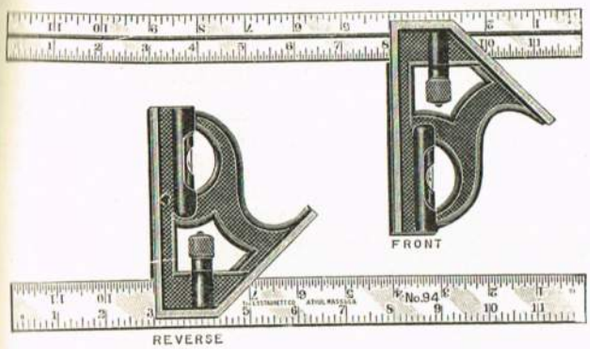

Fig. 633. (No. 94).

New Combination Square No. 94.

With Level, Mitre and Plumb.

This Square will readily appeal to the carpenter and others not requiring a fine graduation of the blade or a scriber. The head may be clamped to any point of the blade. The blade is graduated 8ths and 16ths on both sides, and the lines and figures are very distinct. It is also convenient to square a piece with a surface and at the same time tell whether one or the other is level or plumb. The blade can be used separately as a rule. Combines a *marking gauge, rule, square, mitre, depth gauge, height gauge, level and plumb.* Made in 12″ length only.

Price .... **6/3** each.

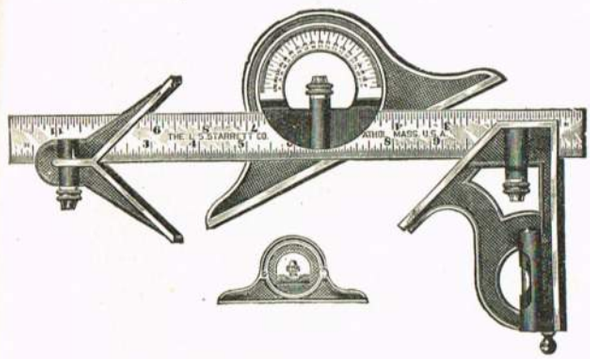

Fig. 634. (No. 9).

Combination Set No. 9.

With Hardened Blade.

This illustration represents No. **11** Combination Square, with centre head and 7″ bevel protractor, both on No. **11** scale. The whole is interchangeable.

9″ set complete,	**25/–**	18″ set complete,	**31/6**
12″ ,, ,,	**27/6**	24″ ,, ,,	**35/–**

No. **9 M.**

Same combination as No. 9, and same price, but blade is graduated ½m/m and 1m/m.

No. **9 M. & E.**

As above, but graduated one side in ½m/m and 1/32″, and reverse side 1m/m and 1/64″. Same price as above.

NEW COMBINATION No. **433.**

Same as No. 33, but with hardened blade and hardened head. All with centre head.

Prices: 9″ set complete, **31/6**; 12″ set complete, **32/6**; 18″ set complete, **37/6**; 24″ set complete, **40/–**; Metric sizes same prices.

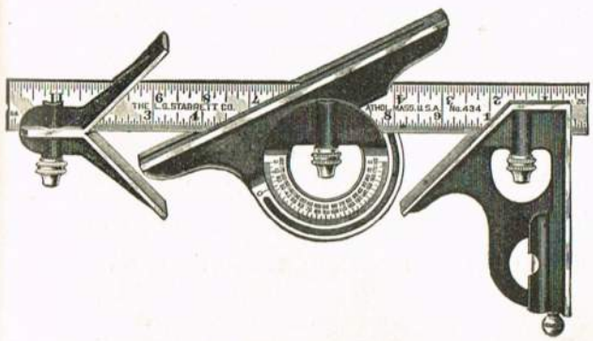

Fig. 635. (No. 434).

Combination Set No. 434.

With Hardened Blade.

This set is almost the same as Set No. **433**, but is furnished with a *Reversible* Protractor Head, No. **490.**

9″ set complete,	**36/6**	18″ set complete,	**42/6**
12 ,, ,,	**37/6**	24″ ,, ,,	**45/–**

No. **434 M.**

Same price as above, but scale graduated in ½m/m and m/m.

No. **434 M. & E.**

Same design and price as above, but one side graduated ½m/m and 1/32″, and reverse side graduated in 1m/m and 1/64″.

No. **435** Set comprises same set as No. **11,** and with Reversible Protractor Head No. **491.**

Prices: 9″ set complete, **30/–**; 12″ set complete, **32/6**; 18″ set complete, **36/6**; 24″ set complete, **40/–**; Metric sizes can be supplied at same price.

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BROWN & SHARPE BEVEL PROTRACTORS.

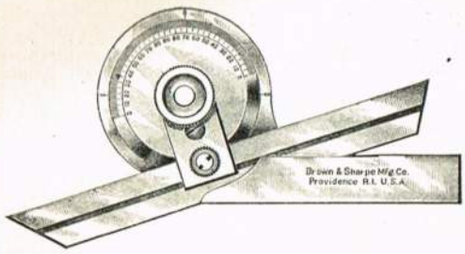

Fig. 640. (No. 493). Improved Bevel Protractor.

This Protractor is for all classes of work where angles are to be laid out or established which do not require such a fine degree of accuracy as is possible with a Protractor having a Vernier.

One side of the tool is flat, thus permitting its being laid flat upon the paper or work.

The dial is accurately graduated to degrees over an arc of 180°, reading 0 to 90° from each extremity of the arc. It turns on a large central stud, which is hardened and ground, and can be rigidly clamped in any position after setting.

The blade is about 1-16 in. thick, can be moved back and forth its entire length, and clamped independently of the dial.

PRICES: Protractor with 6 in. blade, £**2** 3s. **9**d., case **7**s. **6**d.; with 12 in. blade £**2** 9s., case **8**s. **3**d.; with 6 in. and 12 in. blades, £**2** **12**s., case **8**s. **3**d.

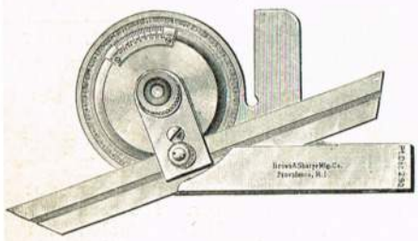

Fig. 641. (No. 495). Improved Universal Protractor.

Protractor No. 495 is well adapted for all classes of work where angles are to be laid out or established.

One side of the tool is flat, thus permitting its being laid flat upon the paper or work.

The dial is accurately graduated to degrees the entire circle. The swivel turns on a large central stud, which is hardened and ground, and can be rigidly clamped by a thumb nut.

The line of graduations is below the surface, protecting them from wear.

The Vernier adds materially to the use of the Protractor in obtaining fine measurements. It reads to 5 minutes or 1-12 of a degree.

By means of a small thumb pinion furnished as an attachment, extremely fine adjustments can be secured.

The blade is about 1-16 in. thick, can be moved back and forth its entire length and clamped independently of the dial.

PRICES: Protractor with 6 in. blade £**3** **7**s. **0**d., morocco case **8**s. **6**d.; with 12 in. blade £**4** **2**s. **3**d., morocco case **9**s. **6**d.; with 6 in. and 12 in. blades £**4** **5**s. **6**d., morocco case **9**s. **6**d.

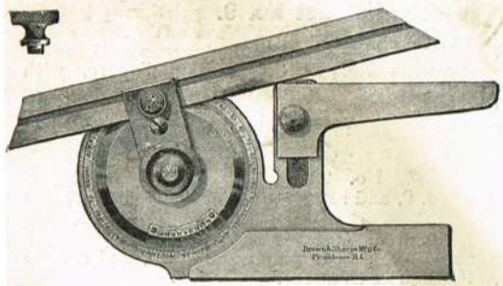

Fig. 642. (No. 496). Improved Universal Bevel Protractor, with acute angle attachment.

The Improved Universal Bevel Protractor with Acute Angle Attachment is designed for all classes of work where angles are to be laid out and, with the attachment, extremely small angles can be easily and quickly established. Alignments are correct, and workmanship throughout the best.

One side of the tool is flat, thus permitting its being laid flat upon the paper or work. The dial is accurately graduated to degrees the entire circle, the graduated surface being depressed, thus protecting the graduations from wear.

A Vernier, which reads to 5 minutes or 1-12 of a degree, adds materially to the fineness to which angles can be laid out. By means of a small thumb screw furnished as an attachment, extremely fine adjustments can be made.

The blade is about 1-16 in thick, can be moved back and forth its entire length and clamped independently of the dial.

PRICES: Protractor with 6 in. blade £**4** **13**s. **9**d., morocco case **8**s. **3**d.; with 12 in. blade £**4** **19**s. **0**d., morocco case **9**s. **3**d. with 6 in. and 12 in. blades £**5** **2**s. **0**d., morocco case **9**s **3**d.

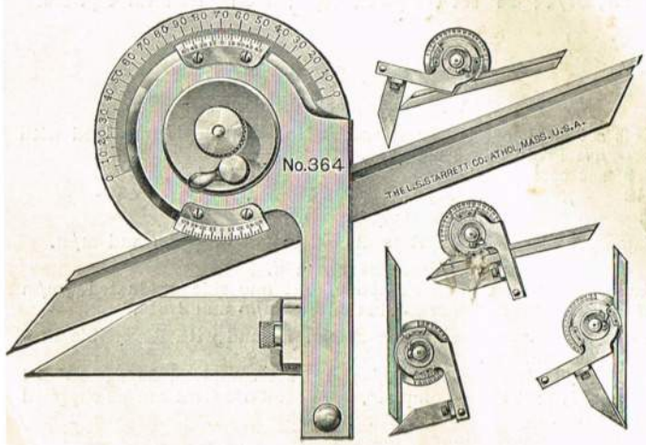

Fig. 650 (No. 364.) STARRETT Universal Bevel Protractor, with Vernier and Acute Angle Attachment.

This Protractor is the same as our No. **360**, see next page, except that it is made with Verniers reading 5 minutes or 1-12 of a degree.

No. **364A**. With 7 in. blade, **77**s. **3**d.; leather case, **8**s. **6**d.

No. **364C**. With 12 in. blade, **82**s. **6**d.; leather case **9**s. **3**d.

No. **364E**. Both 7 in. and 12 in. blades, **85**s. **6**d.; leather case, **9**s. **3**d.

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STARRETT BEVEL PROTRACTORS.

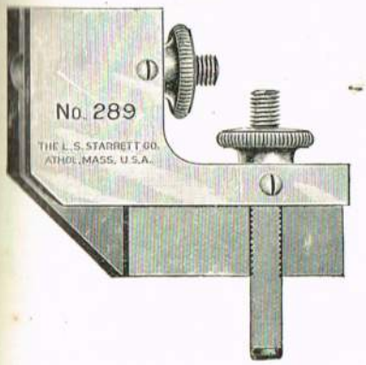

Fig. 653.

Attachment for Combination Squares, No. 289.

The attachment is made to fit the 12, 18 and 24 inch blades of our Nos. 11, 23 and 33 squares, and can be used in connection with any of our regular rules as wide as one inch, or with our thin steel square No. 21, for laying out key seats, etc. The illustration on the next page shows just a few of the ways in which the attachment can be used.

No. 289A.	$1\frac{1}{2}'' \times 1\frac{25}{32}''$.	Price each	**4/3**
No. 289B.	$2\frac{5}{8}'' \times 2\frac{3}{8}''$.	,, ,,	**5/3**

Packed 4 in a box.

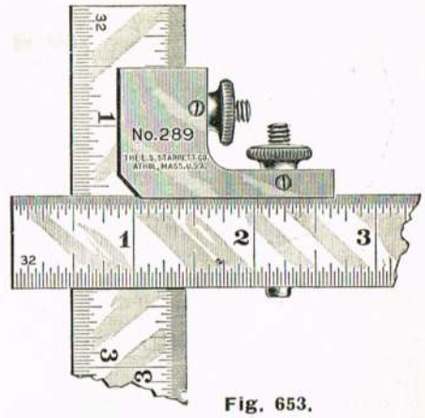

Fig. 653.

UNIVERSAL BEVEL PROTRACTORS

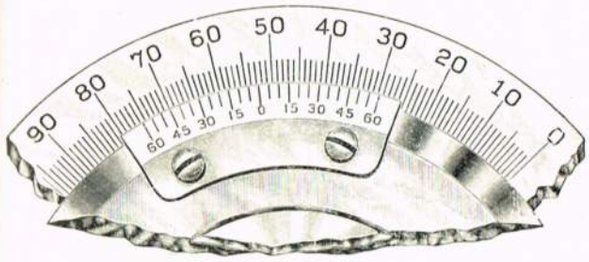

Fig. 654.

How to Read the Universal Bevel Protractor with Vernier.

The disc of the protractor is graduated in degrees from 0° to 90° each way. The vernier plate is graduated so that 12 divisions on the vernier occupy the same space as 23 divisions on the disc. The difference between the width of one of the 12 spaces on the vernier and two of the 23 spaces on the disc is therefore 1/12 of a space on the disc. Each space on the vernier is 1/12 of a degree, or five minutes shorter than two spaces on the disc. If a line on the vernier coincides with a line on the disc and the protractor is rotated until the next line on the vernier coincides with the next line but one on the disc, the vernier has been moved through an arc of 1/12 of a degree, or 5 minutes.

To read the protractor, note on the disc the number of whole degrees between 0 on the disc and 0 on the vernier. Then count in the same direction the number of spaces from 0 on the vernier to a line that coincides with a line on the disc. Multiply this number by 5 and the product will be the number of minutes to be added to the number of whole degrees.

In the above engraving the number of degrees between 0 on the disc and 0 on the vernier is 52. The line marked 45 on the vernier coincides with a line (70) on the disc, the number of spaces from 0 being 9. Multiplying this number by 5 gives 45, the number of minutes to be added to the number of degrees. The reading of the protractor is 52 degrees 45 minutes (52° 45′).

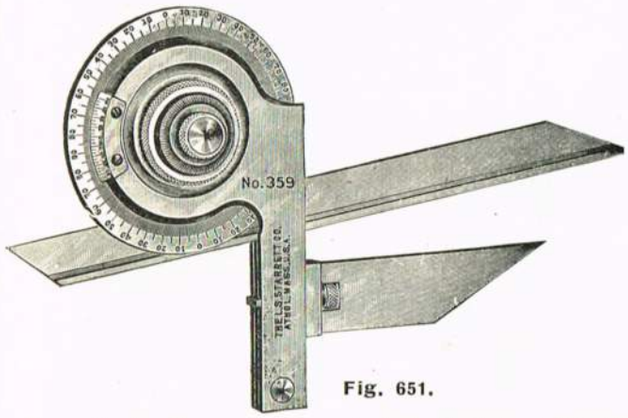

Fig. 651.

The protractor shown on this page is similar in design to No. 364 except that the dial is graduated to degrees the entire circle and is equipped with a vernier, and has encased, a positive method for fine adjustments. This method of fine adjustment, as well as other adjustments, being all controlled from the centre on the front side of the tool, justifies it being called an Improved Universal Bevel Protractor. The lower nut locks the dial in its rotative path, and the middle nut at a slight downward pressure engages the fine adjusting device while the upper nut locks the blade at any point in its length. The acute angle attachment renders it available for obtaining small angles.

Price:	**No. 359A.**	With 7″ blade	**£4 0 9.**	Leather case **8/6.**
	No. 359C.	With 12″ blade	**£4 19 6.**	,, ,, **9/6.**
	No. 359E.	With both 7″ and 12″ blades	**£5 2 3.**	,, ,, **9/6.**

Sent without acute angle attachment when so ordered at a reduction of **12/6** from above list prices.

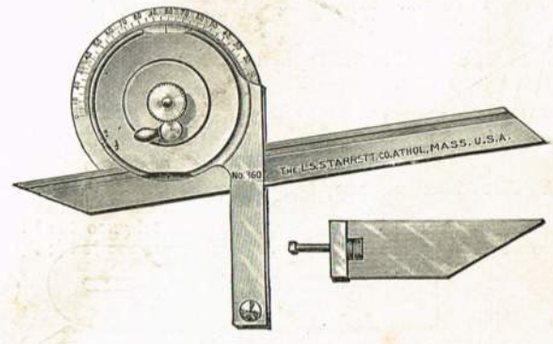

Fig. 652.

The blade is either 7″ or 12″ by $\frac{1}{2}$″ and the stock is 4″ long; both are made from sheet steel, nicely finished. The tool weighs 6 ozs. The disc is graduated in degrees from zero to 90° each way, and rotates the entire circle on a centre stud. The blade, clamped by an eccentric stud against the end of the disc, may slide back and forth its full length or turn through any angle around the circle and be clamped firmly at any point. It is thus adapted to positions impossible with other protractors and renders unnecessary the use of the common bevel in transferring angles. One side of the centre being flat makes it a convenient tool for laying on paper in drafting, and it has double the utility of any similar tool.

The attachment shown in the small cut will be found convenient in obtaining small angles.

Price:	**No. 360A.**	With 7″ blade	**£2 3 9.**	Leather case **7/6.**
	No. 360C.	With 12″ blade	**£2 9 0.**	,, ,, **8/6.**
	No. 360E.	With both 7″ and 12″ blades	**£2 12 3.**	,, ,, **8/6.**
	No. 360G.	Acute angle attachment, extra **12/6.**		

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PROTRACTORS AND BEVELS.

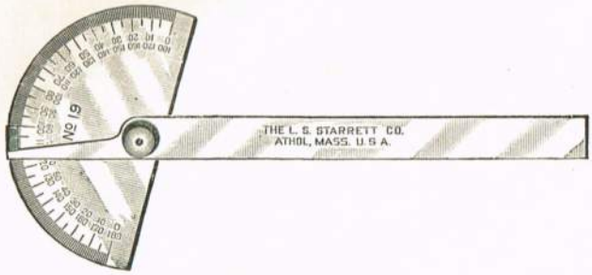


Fig. 655. Protractor No. 19.

Graduated in degrees from 0 to 90, both ways. The blade is 6in. long, and by means of our patent lock joint is set firmly by a slight turn of the nut. The back of the tool is flat. This protractor is accurate, and is convenient for setting bevels, for transferring angles, as a small T-square, or for a large number of other uses which will readily occur to a machinist or draughtsman, and will be found reliable and very satisfactory by any mechanic, especially those who do not care to pay for a more expensive tool.

Price - **12/6.**

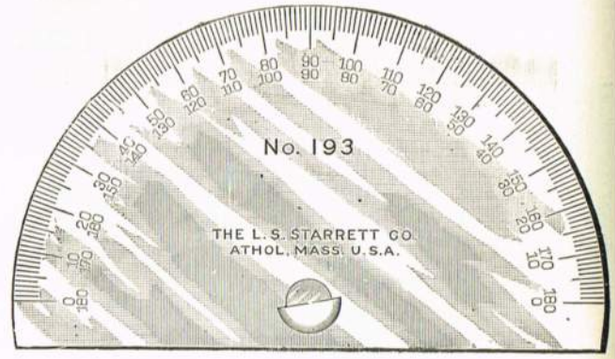


Fig. 656. Protractor No. 193.

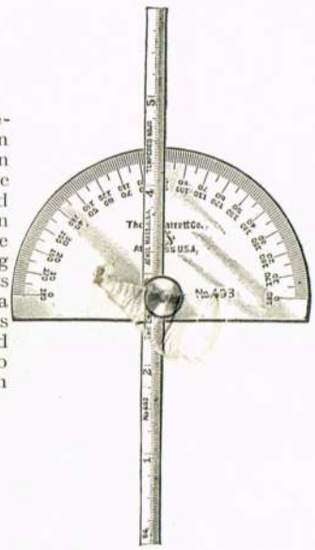
Used for setting bevels No. 15, No. 47 and No. 49 at any desired angle, thus converting them into bevel protractors at slight cost.

Packed 2 in a box. Price .... **5/3.**

Fig. 657. (No. 493) Starrett Protractor and Depth Gauge.

This tool will readily be appreciated by machinists, draftsmen and shop foremen. Any angle in one-half of a circle (180°) may be obtained, and the back is finished to permit its being laid flat upon the paper or work. The blade being adjustable permits its being set at any length within its capacity, permitting its use as a depth gauge. The scale, which is clamped by a conveniently knurled nut, is graduated on one side to read by 32nds of an inch, and on the other by 64ths of an inch.

Price .... **11/6.**



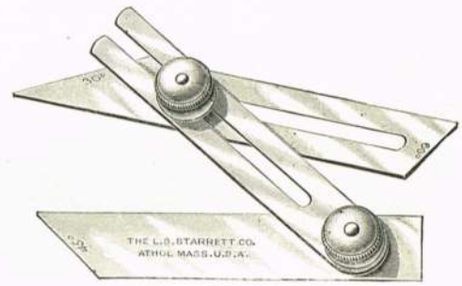


Fig. 658. Combination Bevel No. 49.

This bevel has a stud riveted in the straight edge stock or head, on which its split blade is hinged, so as to swing over the stock and be clamped at any angle. The slotted auxiliary blade, with clamp bolt may be slipped on to the split blade and be clamped at any desired angle and used, in combination with the stock of the other, for laying out work, measuring, or showing any angle desired, and when so combined will lie flat upon its work. The stock is about 4 in. long.

Price .... **10/6.**

Above numbers, packed 1 in a box.

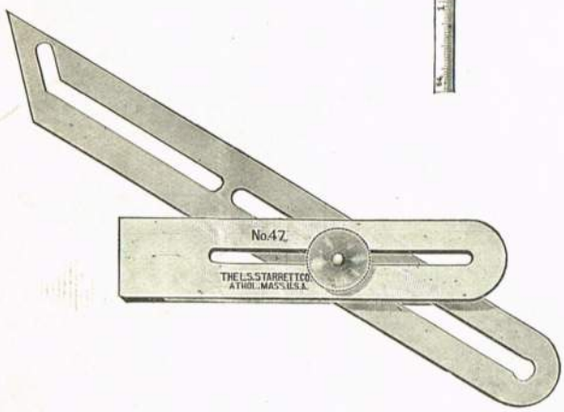


Fig. 659. Improved Bevels No. 47.

The advantages of this bevel over any other tool of this kind made consist in its having not only the blade slotted but the stock as well, thus admitting adjustments that cannot be obtained with a common bevel. The clamping screw head, which the cut does not show, is let into a rabbet, flush with the surface of the stock, allowing it to lie flat on the work.

PRICES :

6 in.	(length of stock	$3\frac{1}{2}$ in.)	....	**7/6**
9 in.	,, ,,	$4\frac{3}{4}$ in.	....	**11/6**
12 in.	,, ,,	6 in.	....	**15/9**

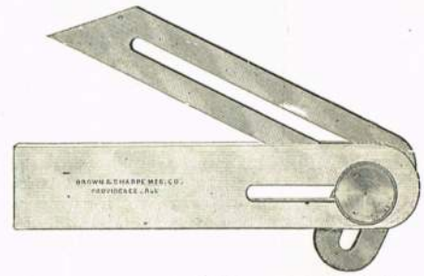


Fig. 660. Improved Universal Bevel No. 499.

The above cut represents an Improved Universal Bevel, 3 in. long, with an offset blade that admits of the measurement of all angles.

The case is solid on the top for $1\frac{1}{2}$ in. from the square end.

Price **8/3**

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SQUARES.

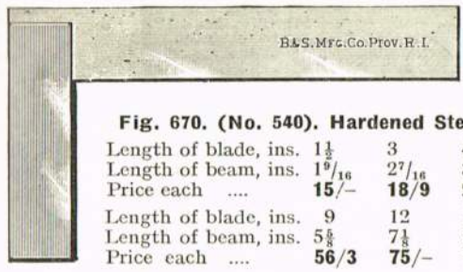


Fig. 670. (No. 540). Hardened Steel Squares.

Length of blade, ins.	$1\frac{1}{2}$	3	$4\frac{1}{2}$	6
Length of beam, ins.	$1^{9}/_{16}$	$2^{7}/_{16}$	$3^{9}/_{16}$	$4\frac{3}{8}$
Price each	**15/–**	**18/9**	**28/9**	**37/6**
Length of blade, ins.	9	12	15	18
Length of beam, ins.	$5\frac{5}{8}$	$7\frac{1}{8}$	$8^{3}/_{16}$	$10\frac{1}{4}$
Price each	**56/3**	**75/–**	**125/–**	**143/9**

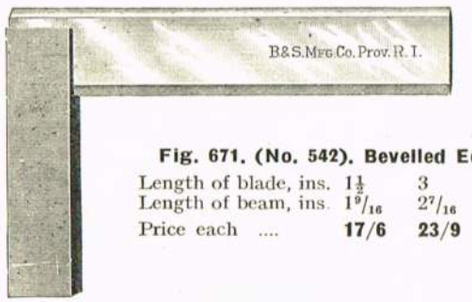


Fig. 671. (No. 542). Bevelled Edge Squares.

Length of blade, ins.	$1\frac{1}{2}$	3	$4\frac{1}{2}$	6
Length of beam, ins.	$1^{9}/_{16}$	$2^{7}/_{16}$	$3^{9}/_{16}$	$4\frac{3}{8}$
Price each	**17/6**	**23/9**	**35/–**	**47/6**

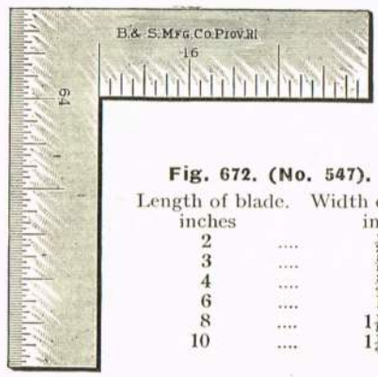


Fig. 672. (No. 547). Thin Steel Squares.

Length of blade. inches		Width of blade. inches		Price each.
2	....	$\frac{1}{2}$	....	**8/9**
3	....	$\frac{5}{8}$	....	**11/3**
4	....	$\frac{3}{4}$	....	**15/–**
6	....	1	....	**21/3**
8	....	$1\frac{1}{8}$	....	**27/6**
10	....	$1\frac{1}{4}$	....	**33/9**

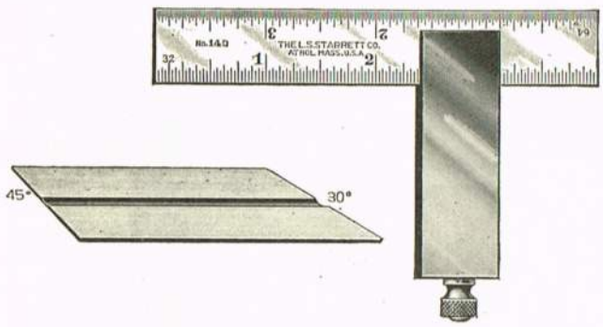


Fig. 676.

(No. 14D.) Starrett All Hardened Steel Double Square furnished with 4″ Sliding Blade, graduated $^{1}/_{32}$″ and $^{1}/_{64}$″ on one side, and $\frac{1}{8}$″ and $^{1}/_{16}$″ on other.

Price, **16/9**. With bevelled blade, **18/9.**

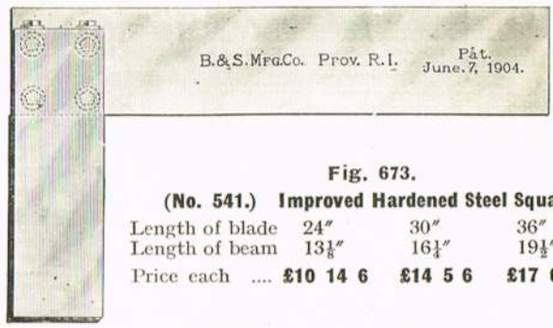


Fig. 673.

(No. 541.) Improved Hardened Steel Square.

Length of blade	24″	30″	36″
Length of beam	$13\frac{1}{8}$″	$16\frac{1}{4}$″	$19\frac{1}{2}$″
Price each	**£10 14 6**	**£14 5 6**	**£17 6 3**

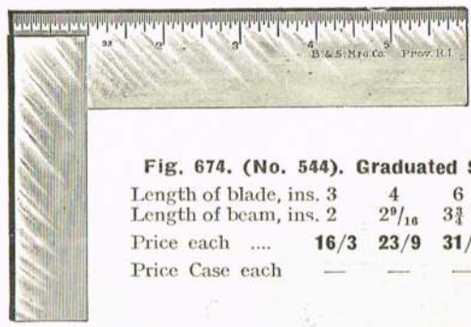


Fig. 674. (No. 544). Graduated Steel Square.

Length of blade, ins.	3	4	6	9	12
Length of beam, ins.	2	$2^{9}/_{16}$	$3\frac{3}{4}$	5	$6^{1}/_{16}$
Price each	**16/3**	**23/9**	**31/3**	**50/–**	**60/–**
Price Case each	—	—	—	**11/6**	**12/6**

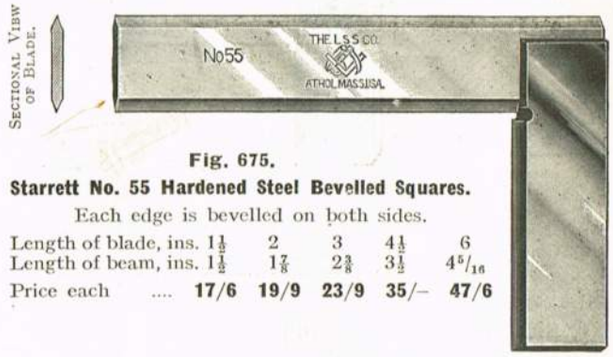


Fig. 675.

Starrett No. 55 Hardened Steel Bevelled Squares.

Each edge is bevelled on both sides.

Length of blade, ins.	$1\frac{1}{2}$	2	3	$4\frac{1}{2}$	6
Length of beam, ins.	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{3}{8}$	$3\frac{1}{2}$	$4^{5}/_{16}$
Price each	**17/6**	**19/9**	**23/9**	**35/–**	**47/6**

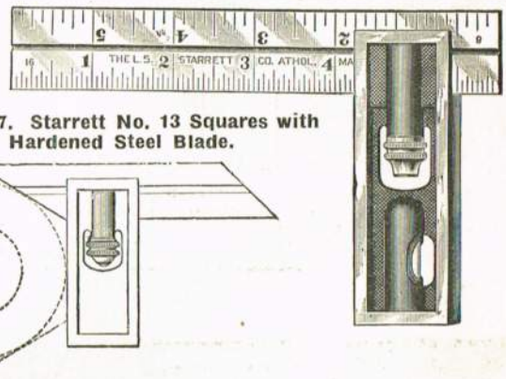
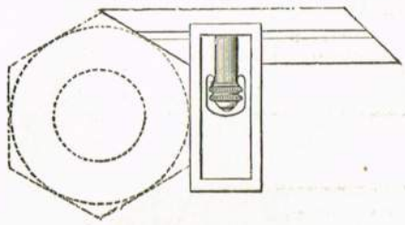


Fig. 677. Starrett No. 13 Squares with Hardened Steel Blade.



Showing No. 13 fitted with bevel blade.

The **No. 13** Square is conceded to be the most practical one for machinists, tool makers' and pattern makers' use ever offered. The sliding blade, shortened or extended full length, makes it more valuable than a full set of the common kind, while with the extra bevel blade, shown in the above cut, we have both the hexagon and octagon angles, a feature of great convenience to the pattern maker.

The seat against which the blade is clamped being convex, should corners of the blade get injured, the accuracy of the square is not affected. The small illustration represents the 4″ and 6″ Double Square, with hexagon end of blade applied. Reverse it and the octagon is in position for use. Bevel blades are for 4″ and 6″ only.

4″	**6/3**	With both blades,	**8/6**	9″	**15/–**	not supplied with bevel blades.
6″	**10/–**	,, ,, ,,	**12/6**	12″	**20/–**	

These Squares furnished in No. 4 graduation. The No. 4 and 6 inch sizes sent with both blades unless otherwise ordered.
There is a level in the stocks of the 6″, 9″ and 12″ squares.

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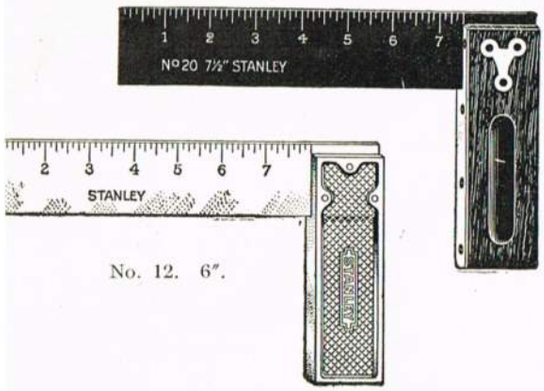
STANLEY TRY SQUARES.



No. 12. 6".

Fig. 680. Iron Handle, No. 12.

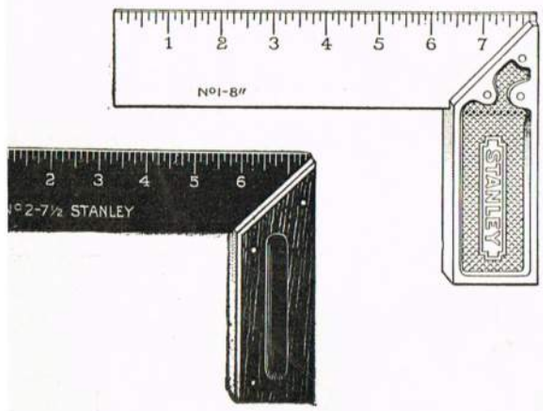
Square inside and out, both edges and ends of handles machined. Blades machined on edges and graduated in ⅛ths. Nickel-plated all over.

Blade, inches	2	4	6	8	10	12
Handle, inches	2	3⅛	4⅜	5⅛	6⅝	8
Price per dozen ...	**23/8**	**28/10**	**37/3**	**41/8**	**54/3**	**64/9**

Fig. 681. Rosewood Handle, No. 20.

Square inside and out; edges of blades machined. Insides of handles have brass face-plate fastened on with screws. Blued finish to blade. Graduated in ⅛ths.

Blade, inches ...	3	4½	6	7½	9	10	12
Handle, inches ...	2⅞	3½	4⅝	5⅜	6	6	7
Price per dozen	**23/6**	**26/7**	**35/5**	**38/7**	**49/7**	**53/7**	**66/–**



COMBINED TRY AND MITRE SQUARES.

Square inside and out; the blades machined; graduated in ⅛ths. Two styles made, one with iron handle, nickel-plated, and nickel-plated blade; the other a rosewood handle and blued blade.

Fig. 682. Iron Handle, No. 1.

Blade, inches	4	6	8	10	12
Handle, inches	3	4	5	5	5
Price per dozen	**32/9**	**40/3**	**48/10**	**57/5**	**66/–**

Fig. 683. Rosewood Handle, No. 2.

Blade, inches	4½	6	7½	9	12
Handle, inches	3⅛	4	5	5¾	5¾
Price per dozen	**35/8**	**41/1**	**47/–**	**56/9**	**70/11**

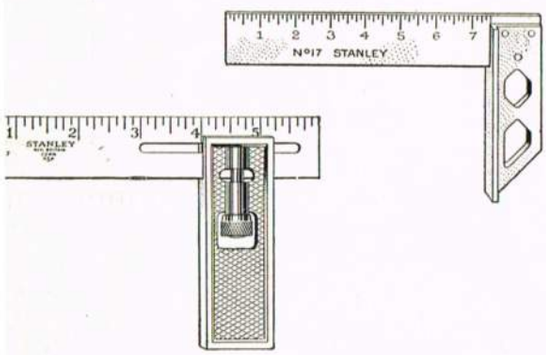


Fig. 684. Mitre Try Squares, No. 17.

Square inside and out; blade machined; graduated in ⅛ths. Very light, nickel-plated all over. Blade, 7½"; handle, 5".

Price ... **47/10** per doz.

Fig. 685. ADJUSTABLE TRY SQUARES, No. 14.

Edges of blade machined; square inside and out; graduated in ⅛ths. Nickel-plated all over.

Blade, inches	4	6
Handle, inches	2¾	3⅝
Price per dozen	**33/4**	**36/11**

STANLEY BEVELS.

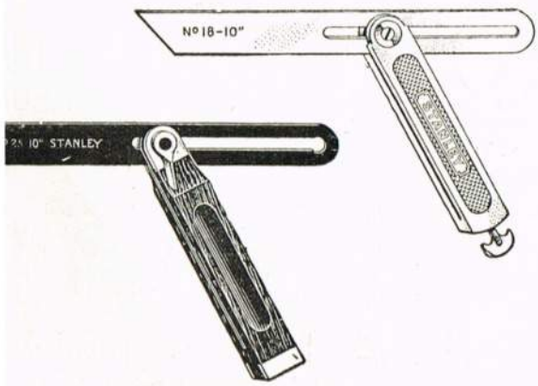


Fig. 686. Metal Handle, No. 18.

Locking device by thumb screw. Nickel-plated all over. The blade is tempered and ground on both edges and sides. The handle is ground on both edges.

Blade, inches	6	8	10
Handle, inches	4¼	5⅛	6¼
Price per dozen	**45/1**	**57/7**	**62/8**

Fig. 687. Rosewood Handle, No. 25.

Locking device by thumb lever. Blade has machined edges and a blue finish.

Blade, inches	6	8	10	12	14
Handle, inches	4⅞	5⅞	7⅜	8½	10¼
Price per dozen	**30/3**	**34/–**	**35/5**	**39/6**	**42/6**

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DISSTON TRY SQUARES, BEVELS, Etc.

DISSTON TRY SQUARES.

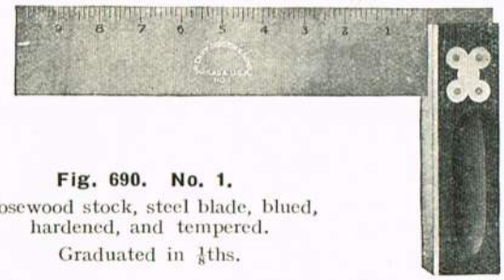


Fig. 690. No. 1.

Rosewood stock, steel blade, blued, hardened, and tempered.

Graduated in $\frac{1}{8}$ths.

Sizes, inches	...	3	4½	6	7½	8
Price per doz.	...	**19/–**	**21/8**	**28/9**	**31/6**	**32/3**
Sizes, inches	...	9	10	12	*15	*18
Price per dozen	...	**39/9**	**43/3**	**54/6**	**68/6**	**92/–**

* With rest.

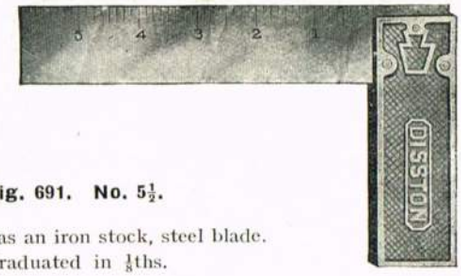


Fig. 691. No. 5½.

This tool has an iron stock, steel blade.

Graduated in $\frac{1}{8}$ths.

Sizes, inches	2	4	6	8	10	12
Price per doz.	**19/6**	**23/6**	**30/3**	**34/3**	**44/9**	**53/-**

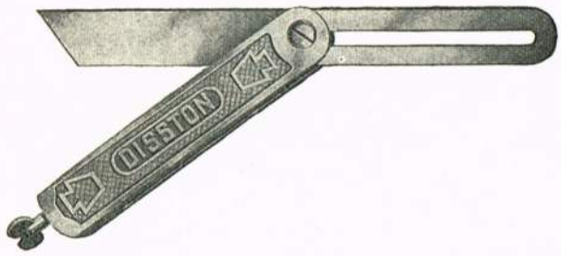


Fig. 692. DISSTON BEVELS, No. 3.

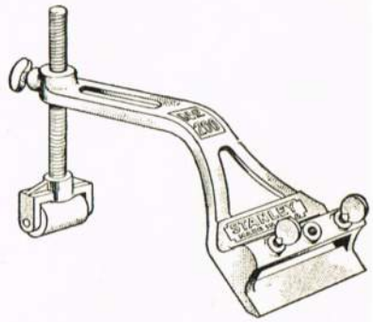
Iron stock, flush screw, parallel edges, steel blade. A turn of the thumb screw operates unique mechanism for tightening blade.

Sizes, inches	...	6	8	10
Price per dozen	...	**36/6**	**46/6**	**50/9**

Fig. 693. No. 200. STANLEY CHISEL GRINDING.

This tool is for holding plane irons and chisels in any desired angle. The cutting tool is held securely in position by two thumb screws. By turning the roller at an angle to the body. Made of steel, all parts heavily nickel-plated.

Price ... ... **6/5** each.



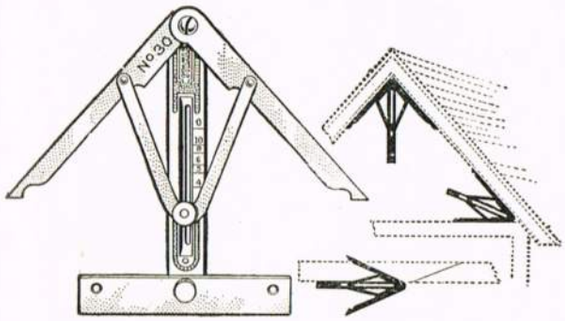


Fig. 694. No. 30. STANLEY ANGLE DIVIDER.

With this tool any angle can be found and bisected. Fitting moulding or other woodwork to odd angles can be done with ease and certainty. It is graduated for parts of the circle commonly used, and can be used as a try or **T** square.

PRICES:

No. 30.—Nickel-plated ... **9/8** each.

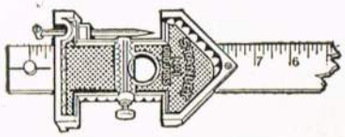
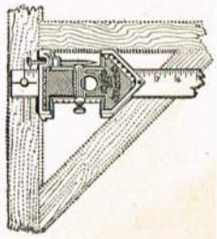


Fig. 695. No. 1. STANLEY "ODD JOBS."

This tool is well named, as with its use the owner can do all ordinary jobs with the addition of only a saw, a hammer, and a plane.

It combines a level, a plumb, try square, mitre square, bevel, scratch awl, depth gauge, marking gauge, mitre gauge, beam compass, and a 1-foot rule. The rule is graduated in sixteenths of inches.

No. 1.—4″ long, nickel plated, **6/2** each.



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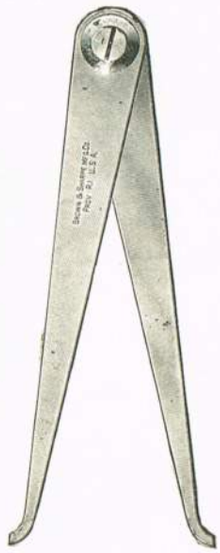
CALIPERS.

FIRM-JOINT CALIPERS, Outside and Inside.

Tempered.

Outside.

Fig. 700.
(No. 821.) Outside.



Inside.

Fig. 701.
(No. 822). Inside.

Price Outside or Inside.

hes	3	4	5	6	8	10	12	14	16	18	20	24
ch	2/3	2/6	3/–	3/3	4/3	4/6	5/–	7/6	8/9	10/9	12/6	15/–

TRANSFER FIRM-JOINT CALIPERS.

Tempered.

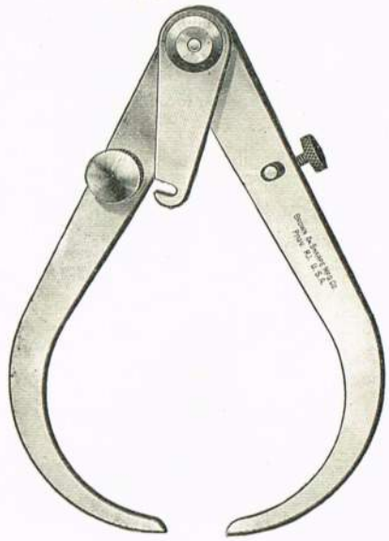


Fig. 702.
(No. 826.) Outside.

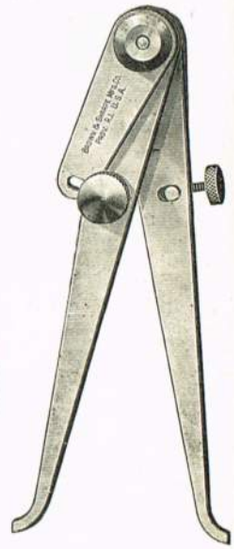


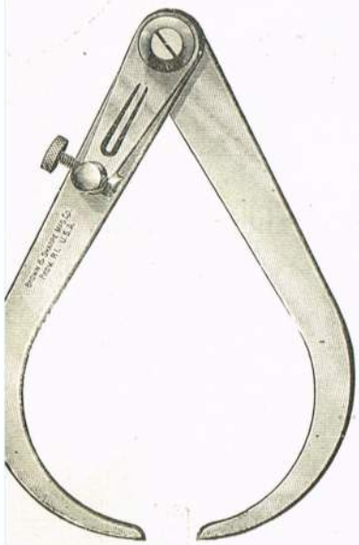
Fig. 703.
(No. 827.) Inside.

Prices Outside or Inside.

Inches	4	5	6	8	10	12	14	16	18	20	24
Each	5/6	6/3	6/9	8/–	9/3	10/6	11/9	13/–	14/3	16/–	20/6

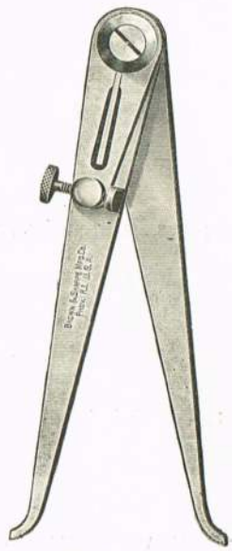
SCREW ADJUSTING FIRM-JOINT CALIPERS.

Tempered.



Outside.

Fig. 704.
(No. 831.) Outside.



Inside.

Fig. 705.
(No. 832.) Inside.

Prices Outside or Inside.

hes	4	5	6	8	10	12	14	16	18	20	24
h	4/6	4/9	5/–	6/3	7/6	8/9	10/–	11/3	12/6	13/9	17/6

Discounts are subject to alteration.

NARROW FIRM-JOINT CALIPER.

Tempered.

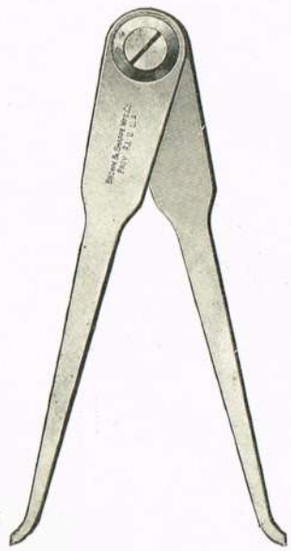


Fig. 706 (No. 837).

Provided with narrowed legs for calipering deep holes. It can be inserted $2\frac{1}{2}''$ deep $\times \frac{1}{4}''$ wide.
Price **3**/– each.

FIRM-JOINT HERMAPHRODITE.

Fig. 707 (No. 835).

Adjustable or Solid Points.

	4″	6″	8″
Adjustable Points	3/3	4/3	5/–
Solid Point	2/6	3/3	4/3

Lowest current prices always charged.

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CALIPERS.

FAY PATENT SPRING PATTERN

Fig. 708.

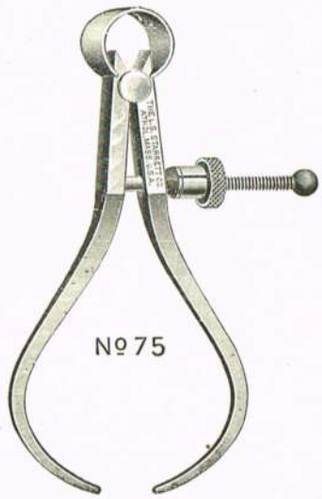

Fig. 709.

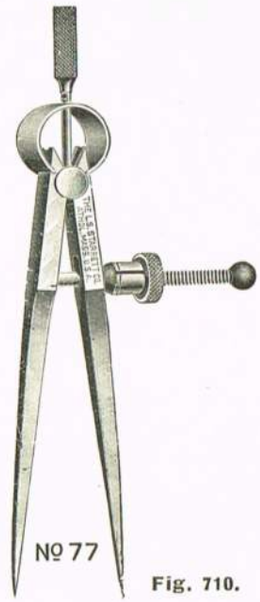

Fig. 710.

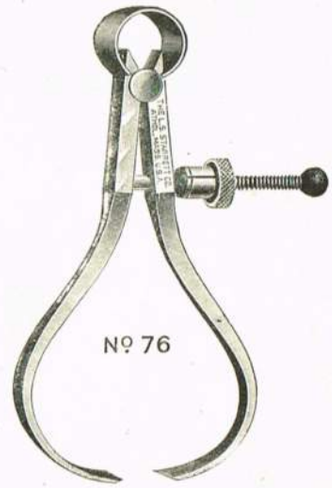

Fig. 711.

Inside. **Outside.** **Dividers.** **Outside Thread Caliper.**

Prices of Nos. 74 and 75.

Size .... ins.	2½	3	4	5	6	8
Price each with solid nut	5/–	5/–	5/9	5/9	7/–	8/3
Price each with spring nut	6/–	6/–	6/3	6/3	7/6	8/9

Prices of No. 77.

	2½	3	4	5	6	8
	5/–	5/–	6/3	6/3	8/3	9/6
	6/–	6/–	7/3	7/3	8/9	10/–

Prices of No. 76.

	3	4	5
	5/–	5/9	5/9
	6/–	6/3	6/3

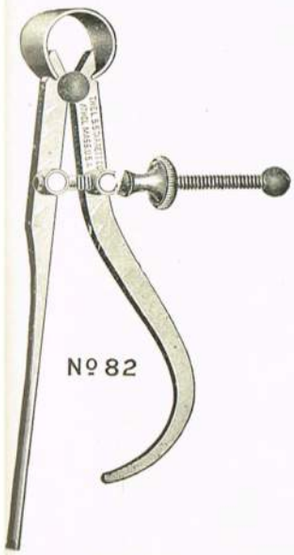

Fig. 712.

Keyhole Calipers.

Fig. 713.

Inside Thread Calipers.

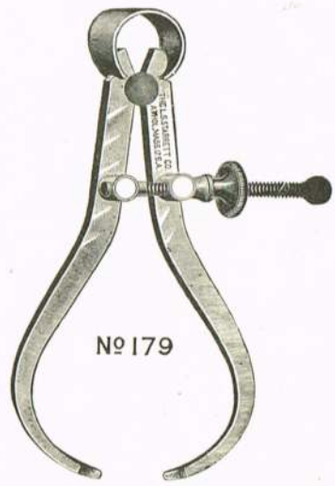

Fig. 714.

Outside (Light pattern) Thread Calipers.

Fig. 715.

Crankshaft Calipers.

Price of No. 82.

Size .... ins.	3	4
Price each with solid nut	3/9	4/–
Price each with spring nut	4/6	4/9

Price of Nos. 184 and 179.

	4	5	6
	4/–	4/3	4/6
	4/9	5/–	5/3

Size ins.	6
Price with solid nut	5/–
Price with spring nut	6/–

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CALIPERS, &c.

Fig. 716.
No. 800. Dividers.

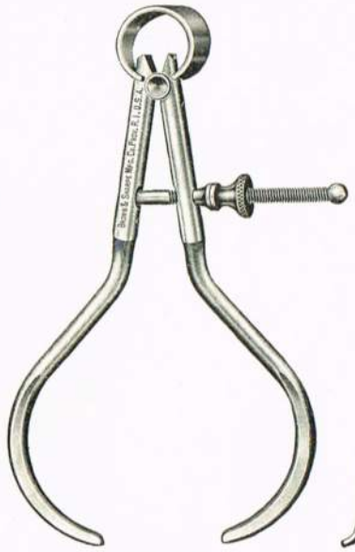

Fig. 717.
No. 801. Outside.

Fig. 718.
No. 802. Inside.

Toolmakers' Patterns.

Hardened Steel Fulcrum Pin, rigid construction. Legs are round, highly polished. 2″ sizes are for small light work and for pocket use.

Same Prices for Nos. 800, 801 and 802.

Size ins.	2	3	4	5	6
Price each	**5/–**	**6/3**	**7/6**	**7/6**	**8/9**

Duplicate Parts for Toolmakers' Calipers and Dividers.

Leg	**1/9**
Screw and ball	**–/9**
Nut	**–/9**
Spring	**1/3**
Spring with thumb attachment for dividers	**2/–**
Thumb Attachment	**–/9**
Nut Washer	**–/3**
Fulcrum Stud	**–/9**

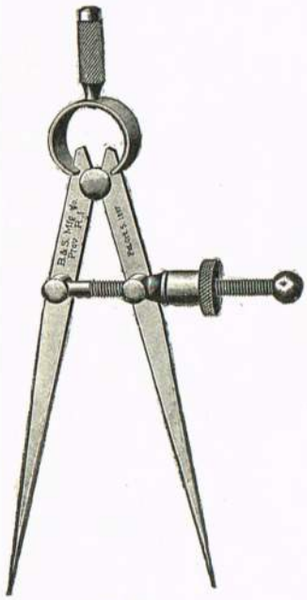

Fig. 719.
No. 810. Dividers.

Fig. 720.
No. 811. Outside.

Fig. 721.
No. 812. Inside.

Rex Spring Light Pattern.

These are somewhat lighter than the Brown & Sharpe, but the same care is taken in their construction as in the more expensive line: the same spring, fitted to the legs in a somewhat different manner, is used, and the same spring nut.

The Rex Calipers are neat and attractive in appearance, and durable. The adjusting screw is hardened to prevent wear. A thumb attachment for convenience in handling is provided on spring dividers.

No. 810. Prices each.

Size ins.	2½	3	4
With solid nut	**3/3**	**3/6**	**3/9**
With spring nut	**4/3**	**4/6**	**4/6**

Size ins.	5	6	8
With solid nut	**4/3**	**4/6**	**5/9**
With spring nut	**4/9**	**5/–**	**6/3**

Nos. 811 and 812. Prices each.

Size ins.	2½	3	4
With solid nut	**3/4**	**3/7**	**3/9**
With spring nut	**4/2**	**4/5**	**4/7**

Size ins.	5	6	8
With solid nut	**4/2**	**4/5**	**5/–**
With spring nut	**4/10**	**5/–**	**5/10**

A set of tools that the experience of the shop man has proved to be essential equipment of the beginner. It is neatly arranged in a folding leather case, as shown in the cut. Size folded, about 7″ × 4¾″ × 1⅜″. **Price £1 18 9.**

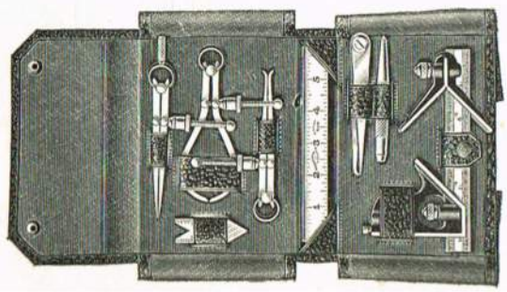

Fig. 730.

Contains the following tools:

No. 300—6″ Tempered Steel Rule, No. 4 graduation.
No. 402—6″ Combination Square, No. 4 graduation (with drop-forged heads).
No. 650—60° Centre Gauge.
No. 765—9-64″ Centre Punch.
No. 810—4″ Rex Divider, solid nut.
No. 811—4″ Rex Outside Caliper, solid nut.
No. 812—4″ Rex Inside Caliper, solid nut.
No. 835—4″ Hermaphrodite Caliper, solid point.

Duplicate Parts for Rex Calipers and Dividers.

Leg	**1/9**
Screw and ball	**–/9**
Solid nut	**–/9**
Spring	**1/3**
Spring with thumb attachment for dividers	**2/–**
Spring nut	**1/3**
Nut washer	**–/9**
Thumb attachment	**–/9**

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CALIPERS.

Starrett Lock-Joint Transfer.

Fig. 731.

Fig. 732.

Size ins.	4	5	6	8	10	12	14	16	18	20	23
Prices ea.	**6/3**	**7/3**	**7/6**	**8/9**	**10/–**	**11/3**	**12/6**	**13/9**	**15/–**	**17/6**	**21/4**

These calipers not only have all the excellent features of Nos. 38 and 39, but in addition may be used inside of chambered cavities, over flanges, etc., removed and replaced without losing the size calipered. This is done by loosening the nut binding one arm to the auxiliary leaf and swinging it out or in (while the joint is locked) to clear the obstruction, then moving it back against a stop where it will show the exact size measured.

The sizes given refer to the length of the calipers, but the outside ones will caliper a cylinder 20 per cent. greater than their length, and the inside calipers will open nearly twice their length.

Starrett Lock-Joint.

Fig. 733.

Fig. 734.

These are reliable lock-joint calipers of wide scope for both inside and outside work, that can be instantly adjusted to their full extent, and as quickly locked firm in the joint, and yet provided with a sensitive adjustment. The improvement consists in a socket joint made tapering and locked or released by a partial turn or the knurled disc. A spring washer under the disc maintains an easy friction in the joint when unlocked.

Size ins.	4	5	6	8	10	12	14	16	18	20	24
Price each	**4/9**	**5/–**	**5/3**	**6/3**	**7/6**	**8/9**	**10/–**	**11/3**	**12/6**	**13/9**	**17/6**

Starrett Hermaphrodite Calipers.

Fig. 735.
No. 42.

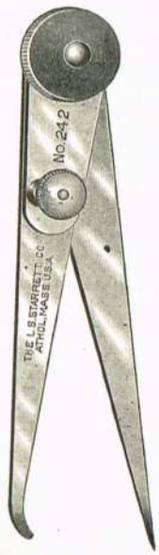

Fig. 736.
No. 242.

Fig. 737.

No. 42.—Adjustable point, lock joint, sensitive adjustment.
Price each—4″ **5/–**, 6″ **6/–**, 8″ **7/–**, 10″ **8/3.**

No. 242.—The same as No. 42 except that both points are solid, neither being adjustable.
Price each—4″ **4/9**, 6″ **5/–**, 8″ **6/3**, 10″ **7/6**.

No. 43.—With improved lock-joint and sensitive attachment, light, tight, large capacity, tempered points.
Price each—6″ **5/–**, 8″ **6/3**, 10″ **7/6**.

Perfect Firm-Joint Screw-Adjusting Calipers. No. 34 (Outside) and No. 35 (Inside).

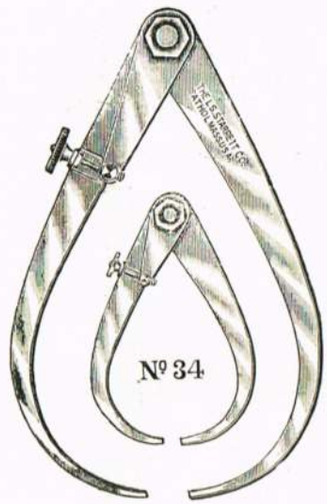

Fig. 738.

Fig. 739.

Fitted with fine adjustment.

Prices of Nos. 34 outside and 35 inside.

Size ins.	4	6	8	10	12	14
Price	**4/9**	**5/–**	**6/3**	**7/6**	**8/9**	**10/–**
Size ins.	16	18	20	24	30	36
Price each	**11/3**	**12/6**	**13/9**	**17/6**	**30/–**	**35/–**

No. 26 (Outside) and No. 27 (Inside) Improved Firm Joint Calipers.

The improvement in these calipers consists in the construction of the joint, which is so made as to be drawn together by means of a screw. The main stud is squared and fitted to one leg, thus preventing the stud from turning when loosening and tightening, and insuring a smooth and uniform friction of more or less tension to suit the user.

Prices of Nos. 26 (Outside) and 27 (Inside).

Size .... ins.	3	4	5	6	8	10	12
Price each....	**2/3**	**2/6**	**3/–**	**3/6**	**4/3**	**4/9**	**5/–**
Size .... ins.	14	16	18	20	24	30	36
Price each....	**7/6**	**8/9**	**10/9**	**12/6**	**15/–**	**25/–**	**30/–**

Caliper No. 27 is not made larger than 24 inches.

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DIVIDERS, Etc.

Fig. 740.

(No. 840.) B. & S. Combination Caliper and Divider.

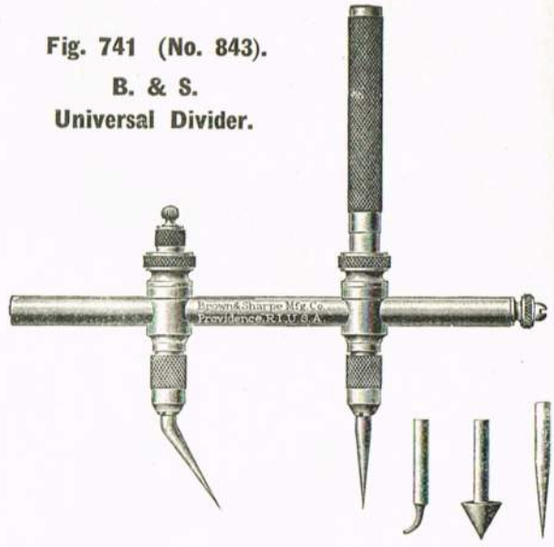
The arms or holders are provided with split chucks to receive the auxiliary legs, which are held firmly by a turn of the knurled nut that closes the chuck concentrically. A pencil can be substituted for one of the legs if desired.

Price complete, **15/-**; with Divider Legs only, **10/-**.

Fig. 741 (No. 843).

B. & S.

Universal Divider.



The scriber point holder has both fine and quick adjustment; the fine adjustment is obtained by a screw, enclosed in the beam, which engages the nut on the scriber point holder. By pulling up the small knurled knob, at top of post, the screw is released and the post can be quickly adjusted; this knob springs into place as soon as released.

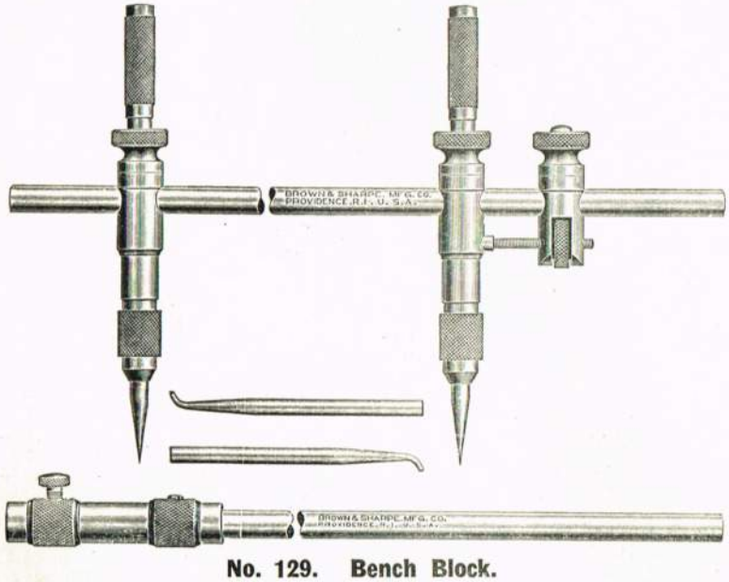
The scriber point is adjustable either side of the centre, and can be set for scribing small circles or for working close to a shoulder. The adjustable centre point is held by a spring chuck and can be easily removed and replaced by a pencil or other special point. The posts are clamped by knurled nuts and held in place by spring friction when the nuts are unclamped for setting the points.

A V point is furnished for use in describing a circle about a hole already drilled. A caliper point is also included.

The beam is 4″ long and the points can be set to describe a circle 8″ in diameter.

Price, **£1/5/0** complete.

Fig. 742 (No. 845). Beam Trammels.



No. 129. Bench Block.

This Block, like many other tools, was designed to meet the demand for something better than an ordinary piece of metal with a hole in it to drive pins in round or flat work. It is made from a forging and is hardened and ground. The knurling shown in the cut, while adding to its appearance, makes it easy to handle. The recess in the base as shown in the semi-sectional view decreases its weight, but it is strong enough to withstand much hard use. The V in the centre is a feature needing no explanation. The holes vary in size from ⅛ inch to ⅜ inch. The block being about 1½ inches high and 3 inches in diameter, appeals to mechanics particular in preserving a finished piece of work where the fitting of dowel pins is necessary.

Price **8/6** each. Packed in box.

No. 854.

Specification and Prices.

The trams are clamped by knurled nuts to the beam, which is flattened on top, and the thrust taken by washers to prevent marring the bearing surfaces. A spring friction holds the trams in place when the nuts are loosened for setting. One tram has an adjusting screw and slide, which is convenient for fine adjustment of the points.

A swivel handle at the top of each tram is a noticeable advantage, as it enables the trammels to be much more conveniently and accurately used than is possible with fixed handles. The adjustable points are held by spring chucks and can be easily removed and replaced by pencil or other special points.

A pair of calipering points is furnished with these trammels.

A pair of V points, by the use of which circles may be described around holes from 1-4″ to 1 5-8″ in diameter, can be furnished for the 13″ trammel if desired. Price, **6/3** extra.

Price each

With	9″	Beam,	will describe circle	18″	diameter,		**25/-**
,,	13″	,,	,, ,,	26″	,,		**25/-**
,,	13″	,,	,, and extension ,,	54″	,,		**29/3**

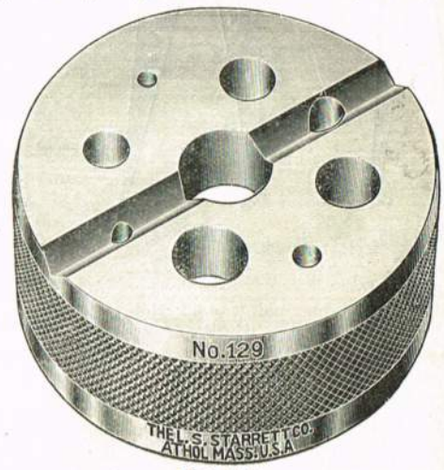


Fig. 743.

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Unfinished.

Fig. 750.
External
Double-ended.

Fig. 751.
Internal
Double-ended Blanks.

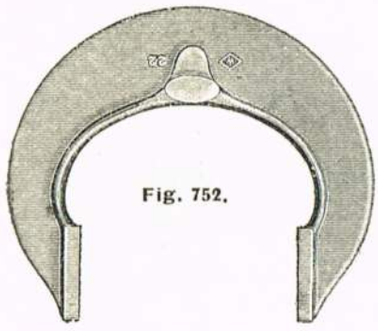

Fig. 752.

Single-ended Snap Gauge Blanks.

Fig. 753.
MORSE TAPER CYLINDRICAL GAUGES.
Style B Plug.

Style A with Tang.

Morse taper gauges are made from the best materials and are accurately machined.

We guarantee them to be perfectly true in all respects. Scientifically hardened and tempered, and finished by a special process of grinding to exact dimensions.

No.		Price of Plug. Style A or B Each		Price of Ring. Style A or B. Each
1	...	**18/6**	...	**36/6**
2	...	**23/6**	...	**47/–**
3	...	**29/–**	...	**57/6**
4	...	**36/6**	...	**73/–**
5	...	**50/–**	...	**90/–**

When ordering, quote Style A or B as well as Size No.

GAUGE AND FLAT STOCK.

Fig. 750/2. VULCAN CALIPER GAUGES.

These are drop-forged from either mild steel, suitable for case-hardening, or from crucible tool steel. We will supply directions for hardening, or will case-harden to order, but cannot undertake machining. The special sizes of the measuring jaw or pad provides for unusual advantages; several classes of gauges may be made from one forging.

Furnished unfinished only, packed half-dozen in a box. Unless otherwise specified mild steel gauges will be furnished.

Size No.	Capacity.	Extreme dimensions. Length	Extreme dimensions. Width	Dimensions of measuring pad. Length	Dimensions of measuring pad. Width	Price Unfinished Mild steel	Price Unfinished *Crucible tool steel
			External Double End.				
2	$\frac{1}{4}$ to $\frac{3}{8}$	$2\frac{1}{8}$	$^{15}/_{16}$	$^{15}/_{32}$	$^{3}/_{16}$	**–/10**	**1/8**
4	$\frac{3}{8}$ to $\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{8}$	$\frac{1}{2}$	$^{3}/_{16}$	**–/11**	**1/10**
6	$\frac{1}{2}$ to $\frac{3}{4}$	$3\frac{1}{8}$	$1^{9}/_{16}$	$^{19}/_{32}$	$\frac{1}{4}$	**1/0½**	**2/1**
8	$\frac{3}{4}$ to 1	$3\frac{5}{8}$	$1^{15}/_{16}$	$^{21}/_{32}$	$^{9}/_{32}$	**1/3**	**2/6**
10	1 to $1\frac{1}{4}$	$4\frac{3}{8}$	$2\frac{3}{8}$	$\frac{3}{4}$	$^{9}/_{32}$	**1/7½**	**3/3**
12	$1\frac{1}{4}$ to $1\frac{1}{2}$	5	$2\frac{3}{4}$	$^{27}/_{32}$	$^{5}/_{16}$	**2/2½**	**4/5**
14	$1\frac{1}{2}$ to $1\frac{3}{4}$	$5^{9}/_{16}$	$3^{1}/_{16}$	$^{15}/_{16}$	$^{5}/_{16}$	**3/–**	**6/–**
16	$1\frac{3}{4}$ to 2	$6^{5}/_{16}$	$3\frac{1}{2}$	1	$^{5}/_{16}$	**4/–**	**8/–**
18	2 to $2\frac{1}{2}$	$7\frac{1}{4}$	$4^{5}/_{16}$	$1^{5}/_{32}$	$^{15}/_{32}$	**5/2½**	**10/5**
20	$2\frac{1}{2}$ to 3	$8^{9}/_{16}$	$5\frac{1}{8}$	$1^{11}/_{32}$	$\frac{1}{2}$	**6/8**	**13/4**
			External—Single End.				
22	3 to $3\frac{1}{2}$	$5\frac{1}{8}$	$5\frac{3}{4}$	$1\frac{1}{2}$	$\frac{1}{2}$	**4/2**	**8/4**
24	$3\frac{1}{2}$ to 4	$5^{11}/_{16}$	$6\frac{1}{3}$	$1^{11}/_{16}$	$^{17}/_{32}$	**5/–**	**10/–**
26	4 to $4\frac{1}{2}$	$6\frac{1}{4}$	$7^{3}/_{16}$	$1^{13}/_{16}$	$^{17}/_{32}$	**6/0½**	**12/1**
28	$4\frac{1}{2}$ to 5	$6^{13}/_{16}$	$7^{13}/_{16}$	2	$^{9}/_{16}$	**7/3½**	**14/7**
30	5 to $5\frac{1}{2}$	$7^{7}/_{16}$	$8\frac{5}{8}$	$2\frac{1}{8}$	$^{9}/_{16}$	**8/9**	**17/6**
32	$5\frac{1}{2}$ to 6	$7^{15}/_{16}$	$9^{3}/_{16}$	$2^{9}/_{32}$	$^{9}/_{16}$	**10/5**	**20/10**
34	6 to $6\frac{3}{4}$	$8^{13}/_{16}$	10	$2\frac{1}{2}$	$^{23}/_{32}$	**13/6½**	**27/1**
36	$6\frac{3}{4}$ to $7\frac{1}{2}$	$9^{11}/_{16}$	11	$2\frac{3}{4}$	$\frac{3}{4}$	**16/8**	**33/4**
			Internal—Double End.				
110	1 to $1\frac{1}{4}$	3	$1\frac{3}{8}$	1	$^{9}/_{32}$	**1/3**	**2/6**
112	$1\frac{1}{4}$ to $1\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{1}{4}$	$^{5}/_{16}$	**1/8**	**3/4**
114	$1\frac{1}{2}$ to $1\frac{3}{4}$	$4\frac{1}{4}$	$1\frac{7}{8}$	$1\frac{1}{2}$	$^{5}/_{16}$	**2/3½**	**4/7**
116	$1\frac{3}{4}$ to 2	$4\frac{7}{8}$	$2\frac{1}{8}$	$1\frac{3}{4}$	$^{5}/_{16}$	**2/11**	**5/10**
118	2 to $2\frac{1}{2}$	$5\frac{3}{8}$	$2\frac{5}{8}$	$1^{15}/_{16}$	$^{15}/_{32}$	**3/9**	**7/6**
120	$2\frac{1}{2}$ to 3	$6\frac{3}{8}$	$3\frac{1}{8}$	$2^{5}/_{16}$	$\frac{1}{2}$	**5/–**	**10/–**

* Crucible tool steel gauges are stamped "T" to indicate their grade.

Fig. 754. GROUND FLAT STOCK.

This stock is of service not only in tool work for making flat gauges, test tools, "jig work," etc., but in all work requiring steel of a definite thickness.

Steel is of first quality, cut the length of the sheet, annealed and ground to within a limit of .001″ of the given thickness.

PRICES.

Thickness inches	Size inches		Price per piece
$^{1}/_{64}$ ...	2 × 18	...	**5/3**
	$2\frac{1}{2}$ × 18	...	**6/6**
	3 × 18	...	**7/9**
	$3\frac{1}{2}$ × 18	...	**9/–**
	4 × 18	...	**10/5**
$^{1}/_{32}$ ...	2 × 18	...	**4/2**
	$2\frac{1}{2}$ × 18	...	**5/3**
	3 × 18	...	**6/3**
	$3\frac{1}{2}$ × 18	...	**7/4**
	4 × 18	...	**8/4**
$^{1}/_{16}$ ...	1 × 18	...	**2/1**
	$1\frac{1}{2}$ × 18	...	**2/11**
	2 × 18	...	**3/9**
	$2\frac{1}{2}$ × 18	...	**4/7**
	3 × 18	...	**5/8**
	$3\frac{1}{2}$ × 18	...	**6/8**
	4 × 18	...	**7/9**
$^{3}/_{32}$ ...	1 × 18	...	**2/4**
	$1\frac{1}{2}$ × 18	...	**3/2**
	2 × 18	...	**4/–**
	$2\frac{1}{2}$ × 18	...	**4/10**
	3 × 18	...	**5/10**
	$3\frac{1}{2}$ × 18	...	**6/11**
	4 × 18	...	**7/11**
$\frac{1}{8}$ ...	1 × 18	...	**2/6**
	$1\frac{1}{2}$ × 18	...	**3/4**
	2 × 18	...	**4/2**
	$2\frac{1}{2}$ × 18	...	**5/3**
	3 × 18	...	**6/3**
	$3\frac{1}{2}$ × 18	...	**7/4**
	4 × 18	...	**8/4**

Thickness inches	Size inches		Price per piece
$^{5}/_{32}$ ...	1 × 18	...	**2/9**
	$1\frac{1}{2}$ × 18	...	**3/9**
	2 × 18	...	**4/10**
	$2\frac{1}{2}$ × 18	...	**5/10**
	3 × 18	...	**7/1**
	$3\frac{1}{2}$ × 18	...	**8/4**
	4 × 18	...	**9/7**
$^{3}/_{16}$ ...	1 × 18	...	**2/11**
	$1\frac{1}{2}$ × 18	...	**4/2**
	2 × 18	...	**5/5**
	$2\frac{1}{2}$ × 18	...	**6/8**
	3 × 18	...	**7/11**
	$3\frac{1}{2}$ × 18	...	**9/7**
	4 × 18	...	**10/10**
$^{7}/_{32}$ ...	1 × 18	...	**3/4**
	$1\frac{1}{2}$ × 18	...	**4/10**
	2 × 18	...	**6/3**
	$2\frac{1}{2}$ × 18	...	**7/9**
	3 × 18	...	**9/2**
	$3\frac{1}{2}$ × 18	...	**10/10**
	4 × 18	...	**12/6**
$\frac{1}{4}$ ...	1 × 18	...	**3/9**
	$1\frac{1}{2}$ × 18	...	**5/5**
	2 × 18	...	**7/1**
	$2\frac{1}{2}$ × 18	...	**9/–**
	3 × 18	...	**10/10**
	$3\frac{1}{2}$ × 18	...	**12/9**
	4 × 18	...	**14/7**

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STRAIGHT EDGES AND VEE BLOCKS.

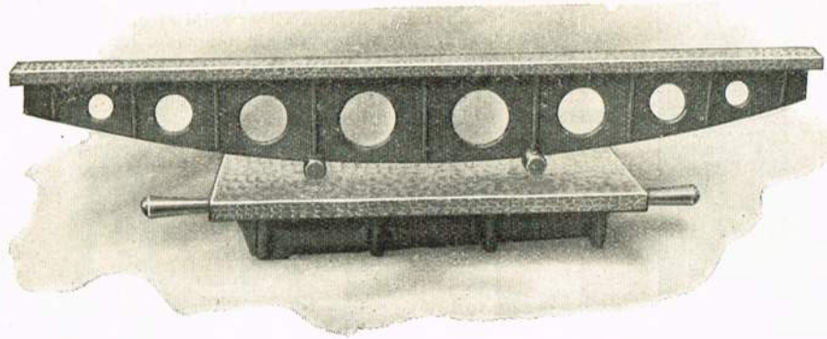


Fig. 760. CAST IRON STRAIGHT EDGES.

Finished hand scraped, perfectly accurate to $^1/_{5000}$". Made of hard, close grain iron. Sides planed square and polished. They are ribbed and designed in the best manner for them to retain their accuracy under varying conditions, and are as light as possible without sacrificing rigidity. Feet are provided, and the Straight Edges when turned face upwards will stand firmly on these without further support, which will be found extremely convenient in use.

Size	A	B	C	D	E	F	G
Dimensions, inches	12 × 1¼	24 × 1¾	36 × 2¼	48 × 2½	60 × 2½	72 × 3	96 × 3½
Weight, lbs.	7	23	36	60	80	112	165
Price each, including wood cover	**32/6**	**45/6**	**70/–**	**90/–**	**130/–**	**170/–**	**240/–**

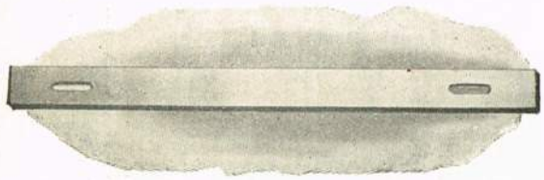
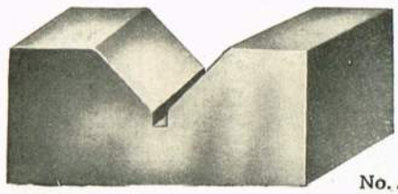


Fig. 761. STEEL STRAIGHT EDGES.

These Straight Edges are made from high quality steel and are machined all over. They can be supplied with one or both edges surfaced true to within $^1/_{5000}$th of an inch.

Hand holes as shown are provided in sizes over 6 feet long.

Size	A	B	C	D	E	F	G
Dimensions, inches	24 × 4 × ⅜	36 × 4 × ⅜	48 × 4 × ⅜	60 × 4 × ⅜	72 × 4 × ⅜	84 × 6 × ½	96 × 6 × ½
Weight, lbs.	10	15	20	25	30	70	80
Price surfaced on both sides	**32/6**	**48/6**	**70/6**	**90/–**	**110/–**	**155/–**	**173/6**
Price surfaced	**24/6**	**34/6**	**50/6**	**58/6**	**75/6**	**99/6**	**130/–**

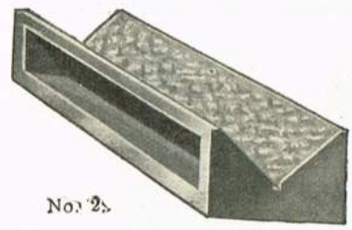


No. 1.

Fig. 762. CAST IRON VEE BLOCKS.

With one Vee.

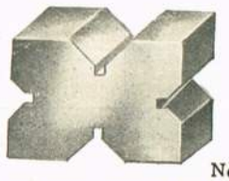
Size, inches	2 × 1	2½ × 1¼	3 × 1½	4 × 2	6 × 3
Price per pair	**4/6**	**5/–**	**6/–**	**11/6**	**24/9**



No. 2.

Fig. 763. LONG VEE BLOCKS.

Length, inches	4	6	8	11¾
Breadth, inches	1½	2	3	4
Height, inches	1	1½	2	3
Price per pair	**20/–**	**27/–**	**33/6**	**40/–**

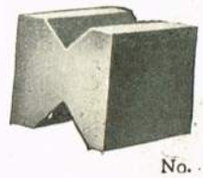


No. 3.

Fig. 764. VEE BLOCKS.

With four different size Vees.

Size, inches	4¼ × 4 × 3	6 × 5½ × 3
Price per pair	**40/–**	**66/9**



No. 4.

Fig. 765. VEE BLOCKS.

With two Vees. Polished.

Sizes, inches	1 × 1	1¼ × 1¼
Price per pair	**6/–**	**8/–**

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ANGLE PLATES.

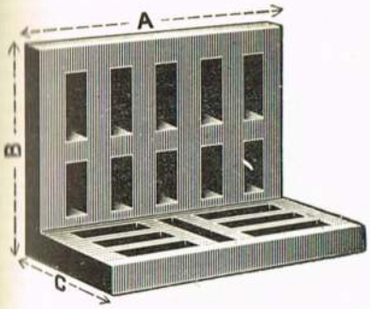

Fig. 766. Type A.

ANGLE PLATES OF SUPERIOR GRADE

supplied in 5 types, as follows:

A and B, as illustrated;

C—Same design as A, but having the corners of the base rounded;

O—Planed on outside faces and edges;

OO—Planed all over.

Fig. 767. Type B.

No.	1	2	3	4	5	5A	6	7	8	9	10	11	12	13	14	14A
Length A, inches	3	3	3	3½	3½	4	4	4	4½	4½	4¾	5	6	6	6	7
Height B, inches	1½	2	2½	1½	2	2	2½	3	4	3	2½	4	3	5	6	3½
Base C, inches	1½	2	2	1½	1½	2	2½	3	3	2½	2	4	2½	4½	6	3
Price—O	**1/8**	**1/11**	**2/3**	**1/10**	**2/1**	**2/6**	**3/–**	**3/6**	**4/6**	**3/6**	**5/4**	**6/–**	**4/9**	**7/–**	**7/6**	**5/–**
Price—OO	**2/6**	**2/10**	**3/2**	**2/8**	**3/–**	**3/8**	**4/4**	**4/8**	**5/8**	**4/8**	**4/6**	**7/9**	**5/9**	**8/9**	**9/6**	**6/–**

No.	15	15A	16	17	18	19	19A	19B	20	21	22	23	24	25	26	27
Length A, inches	8	9	9	9	10	11	12	12	12	12	13	13	16	16	16	24
Height B, inches	5½	4	5½	9	6	7	5	6	9	12	9	12	9	12	12	12
Base C, inches	4½	4	3½	9	6	7	5	4½	9	12	9	9	9	9	12	12
Price—O	**8/6**	**8/3**	**8/6**	**13/–**	**11/–**	**12/6**	**12/6**	**13/–**	**22/–**	**28/6**	**24/–**	**28/–**	**29/–**	**34/–**	**38/–**	**48/–**
Price—OO	**10/6**	**10/–**	**10/6**	**19/–**	**17/6**	**18/–**	**18/–**	**18/–**	**30/–**	**38/–**	**30/–**	**36/–**	**37/–**	**44/–**	**50/–**	**61/–**

Type F.—**Box Angle Plate**, open at the bottom side only. Enables work to be drilled, planed or otherwise machined on five different faces at a single setting, ensuring holes and surfaces being truly square and parallel with each other. Frequently obviates the use of expensive jigs and tools, and is particularly handy in the tool room in the manufacture of jigs, etc.

No.	41	42	43	44	45	46	47
Length A, inches	6	7½	9	12	18	24	30
Breadth B, inches	5	6	7	10	12	18	24
Height C, inches	4½	5	6	9	9	15	18
(*b*) Machined on all faces and ⊥ slots to fit bolt shanks	**16/6**	**22/–**	**30/–**	**55/–**	**95/–**	**200/–**	**350/–**
(*c*) ⊥ Slots machined from solid extra	**3/6**	**4/6**	**5/9**	**8/–**	**12/–**	**17/–**	**25/–**

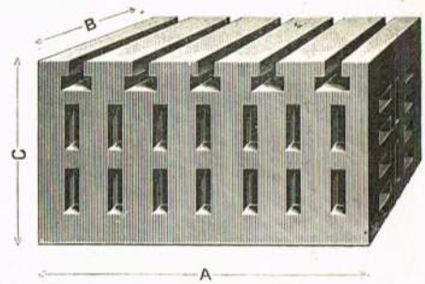

Fig. 768. Type F.

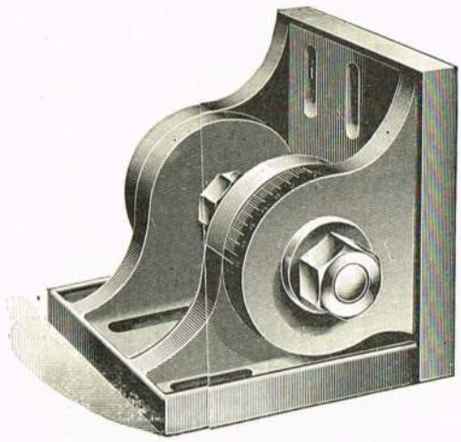

Fig. 769. Type G.

Type G.—**Adjustable Swivel Angle Plate.** Indispensable in machining angular work. Swivel is graduated from 0° to 90° to facilitate setting. Very strong and rigid. A machine vice may be fixed on the swivelling table if desired. At a small extra charge any size will be altered to suit customers' own vices. The table may be had with ⊥ slots instead of the plain slots shewn, at special prices.

DIMENSIONS AND PRICES.

No.	61	62	63	64	65	66	67
Length A, inches	6	8	10	12½	15	20	24
Breadth B, inches	5	6	8	10	12	15	16
Price	**55/–**	**65/–**	**80/–**	**100/–**	**140/–**	**200/–**	**260/–**

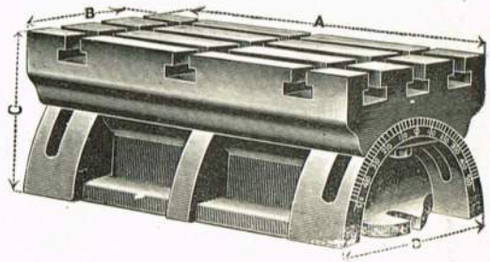

Fig. 770. Type H.

Type H.—**Tilting Table**. A particularly useful appendage to any machine tool. When used on the milling machine often saves expensive angle cutters. Is graduated to swivel each way, enabling work to be done at varying angles. The ⊥ slots are machined from the solid.

DIMENSIONS AND PRICES.

No.	70	71	72	73	74	75
Length A, inches	8	8	10	10	12	12
Breadth B, inches	4	6	5	7½	6	9
Height C, inches	3¼	3¼	3⅞	3⅞	4½	4½
Breadth of Base D, inches	4	4	5	5	6	6
Swivels each way deg. °	45	35	45	35	45	35
Price	**50/–**	**60/–**	**65/–**	**72/6**	**80/–**	**90/–**

No.	76	77	78	79	80	81
Length A, inches	15	15	18	18	24	24
Breadth B, inches	7½	11¼	9	13½	12	18
Height C, inches	5⅜	5⅜	6¼	6¼	8	8
Breadth of Base D, inches	7½	7½	9	9	12	12
Swivels each way deg. °	45	35	45	35	45	35
Price	**100/–**	**112/6**	**130/–**	**145/–**	**170/–**	**190/–**

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SURFACE PLATES.

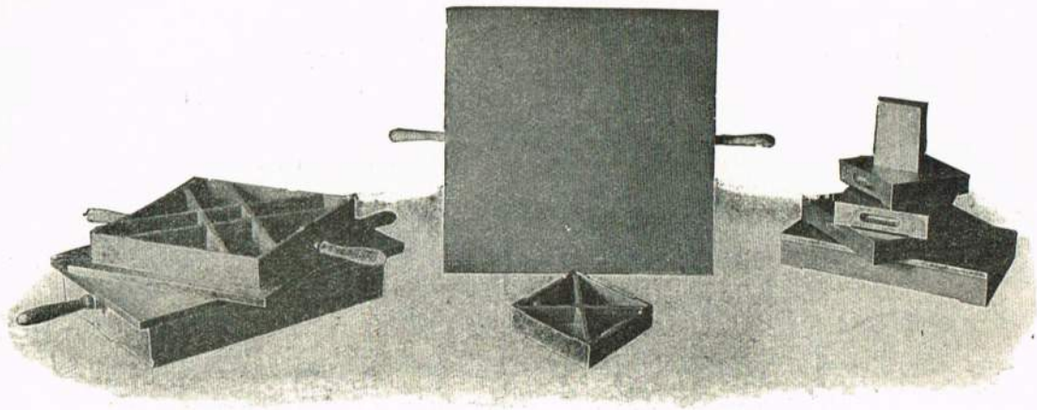

Fig. 775. "CROWN" SURFACE PLATES AND SETTING-OUT PLATES.

High-grade Surface Plates, finished with a special process, producing a guaranteed accuracy of $^1/_{5000}$th of an inch, for very fine and delicate work.

Size inches	Price Grade A £ s. d.	Price of cover s. d.	Size inches	Price Grade A £ s. d.	Price of cover s. d.	Size inches	Price Grade A £ s. d.	Price of cover s. d.
6×4	0 13 6	1 0	20×8	2 7 6	2 10	30×20	7 2 6	6 6
8×5	1 0 0	1 4	30×6	2 8 6	3 0	30×24	7 15 6	7 6
10×4	1 0 0	1 4	12×16	2 10 0	3 0	36×24	10 0 0	9 6
9×6	1 2 0	1 6	14×14	2 11 6	3 2	48×24	12 0 0	12 6
8×8	1 5 0	1 8	12×18	2 17 6	3 4	36×36	13 10 0	13 6
8×10	1 8 0	1 10	18×15	3 12 6	3 6	60×24		
8×12	1 10 0	2 0	24×12	3 19 0	3 10	48×36		
9×12	1 14 6	2 2	18×18	4 5 0	4 2	72×48	Kept in stock. Prices on application.	
9×14	1 18 6	2 4	24×18	5 12 6	4 6	72×72		
12×12	2 1 0	2 6	30×16	5 17 6	5 0	96×72		
10×15	2 3 6	2 8	24×24	6 15 0	5 6			

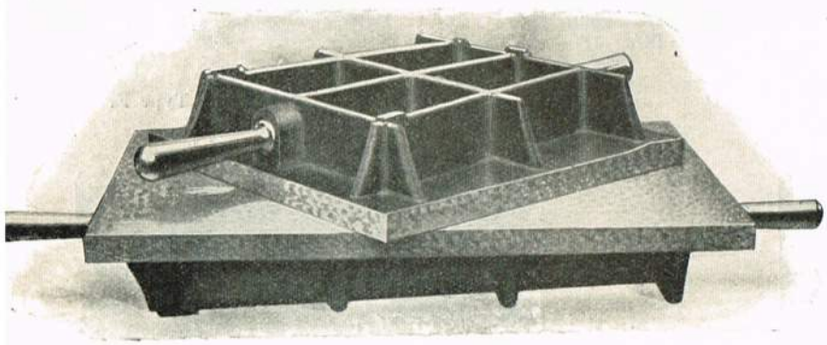

Fig. 776.

These Surface Plates are hand-scraped and accurate to $^1/_{5000}$th of an inch. Sides planed square and polished, fitted with turned and polished steel handles.

Pine wood covers can be supplied if required at prices ranging from **1/–** to **£1.**

Size in inches	Price each £ s. d.	Approx. wght. in lbs.	Size in inches	Price each £ s. d.	Approx. wght. in lbs.	Size in inches	Price each £ s. d.	Approx. wght. in lbs.
4×4	0 16 9	4	12×8	2 10 0	28	18×18	6 3 6	116
6×4	0 18 9	5½	12×9	2 13 6	35	24×12	6 3 6	112
6×6	1 2 9	10	12×10	2 18 9	41	24×18	9 6 9	154
8×6	1 6 9	15	12×12	3 3 6	48	24×24	10 13 6	220
8×8	1 12 0	18	14×10	3 6 9	45	30×16	10 6 9	186
9×6	1 10 9	16	16×10	3 17 6	50	30×24	12 13 6	252
9×9	2 0 0	25	16×16	5 0 0	96	36×24	16 0 0	335
10×4	1 4 9	12	18×9	4 0 0	60	36×36	24 0 0	504
10×8	2 1 6	25	18×12	4 19 6	74	48×24	23 13 6	470
10×10	2 10 0	29	18×15	5 10 0	90			

PRICES AND PARTICULARS OF SURFACE OR SETTING-OUT PLATES.

Accurately planed on top and four sides, without handles.

Fig. 777. Bench Type.

Size in inches	Price each
8×8	0 16 9
8×12	£1 4 9
12×12	£1 16 0
12×18	£2 16 0
18×18	£4 0 0
18×24	£6 0 0
24×24	£8 0 0
24×36	£11 6 9

Fig. 778. Mounted on Standards.

Size in inches	Price each
4×4	Prices on Application.
6×4	
8×6	
10×4	
10×6	
12×10	
16×10	
24×12	

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BLOCKS, FACE PLATES, Etc.

Fig. 780. No. 1.

Fig. 781. No. 2.

Fig. 782. No. 3.

FACE PLATES, CATCH PLATES, AND CHUCK BACKS.

These plates are accurately turned and faced, and are strong and well-proportioned. Finished catch plates are turned all over. All finished plates are bored with plain centre hole, unless otherwise ordered.

PRICES AND DIMENSIONS.

Diagram of plate, inches ...	...	3½	4	5	6	7	8	9	10	11	12	14	16	18	20	24
Face plate, finished price	...	—	**5/8**	**8/–**	**10/–**	**11/9**	**13/6**	**16/9**	**19/9**	**22/–**	**24/–**	**28/6**	**41/8**	**49/3**	**59/9**	**71/9**
Catch plate, finished price	...	**6/–**	**6/9**	**9/–**	**10/9**	**12/9**	**14/9**	**17/9**	**21/6**	—	—	—	—	—	—	—
Approx. weight in lbs. ...	...	2	3	4	5	9	10	11	13	20	22	37	56	84	102	128
Castings only	...	**1/–**	**1/6**	**2/–**	**2/6**	**4/–**	**4/6**	**5/–**	**6/6**	**9/6**	**11/–**	**15/–**	**22/6**	**29/6**	**39/–**	**50/–**

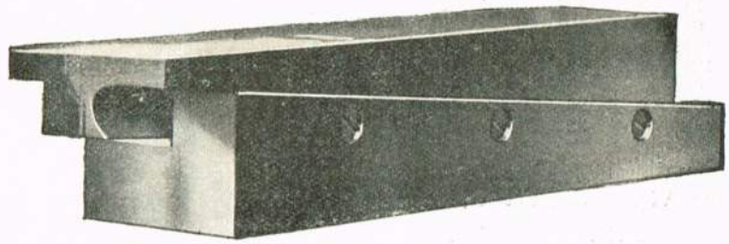
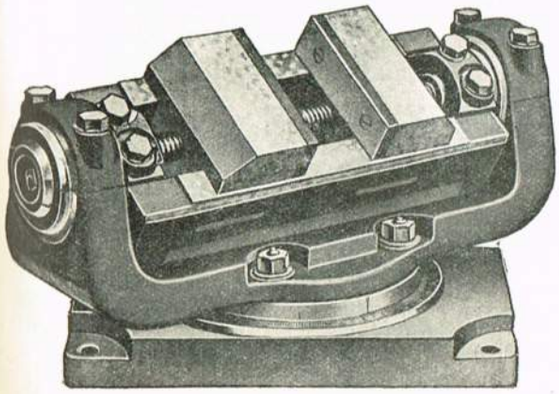


Fig. 783. CAST-IRON ADJUSTABLE PACKING BLOCKS.

No.		Length		Width		Height		Weight in lbs.		Price
1	...	6″	...	1½″	...	1″ to 1½″	...	2½	...	**8/–**
2	...	6″	...	1½″	...	1½″ to 2″	...	4	...	**9/–**
3	...	8″	...	1¾″	...	2″ to 2½″	...	8	...	**11/–**
4	...	8″	...	1¾″	...	2½″ to 3″	...	10	...	**12/–**

These adjustable Parallel Packings will be found more convenient and much cheaper than the numerous solid parallel packings which would be required to cover the same range. They are machined all over and accurately fitted. The two slides can be locked together when in use, to prevent slipping.



Shewing the "Gretrex" Universal Vice adjusted to an angle in two directions.

MACHINE VICES.

Fig. 784.

THE "GRETREX" UNIVERSAL MACHINE VICE.

Of entirely new design, this vice supplies a long-felt want, and is really universal. The jaws are operated by a single screw, and the work is held firmly in position. This vice can be adjusted in a vertical plane to any angle either side. The vice rests in a cradle, is mounted on a base plate, and can be swivelled round. Any horizontal angle can be obtained by setting the cradle to the desired degree graduated on the base plate. The vice is firmly held by strong bearings.

Size	A	B	C	D	E	F	G
Width of jaws, inches	2	3	4	5	6	7	8
Opening of jaws, inches	3	4	5	6	7	8	9
Weight, lbs.	28	40	77	122	165	230	310
Price each	**45/–**	**65/–**	**90/–**	**130/–**	**140/–**	**180/–**	**210/–**

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MACHINE VICES.

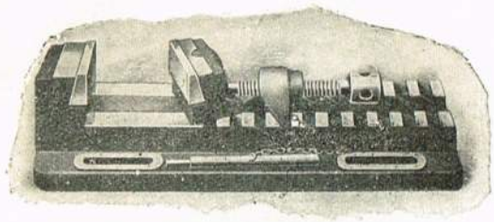

Fig. 790. Retiring Jaws.

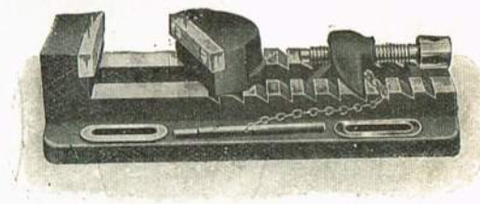

Fig. 791. Fixed Jaws.

The "XL" Improved Machine Vice with Plain Base.

A popular model machine vice for use on drilling, milling, planing and shaping machines. Guaranteed accurate. The loose jaws allow taper or irregular piece to be securely held in position. The clamping screws on Models 6 to 8 have hexagon heads and are provided with a steel box spanner.

Size	Width of jaws inches	Depth of jaws inches	Opens inches	Length overall inches	Width overall inches	No. of slots in base	Size of slots inches	Weight lbs.	Prices—each Fixed jaws	Prices—each Retiring jaws
A	3	1¼	4½	10½	7	2	⅝	20	**65/–**	**71/–**
B	3	1¼	7½	14	7	4	⅝	27	**69/–**	**75/–**
C	4	1½	5	13¾	8½	2	⅝	26	**72/–**	**80/–**
D	4	1½	7½	16¼	8½	4	⅝	36	**80/–**	**88/–**
E	5	2	9½	19¼	9½	4	⅝	60	**104/–**	**113/–**
F	5	2	12½	22¼	9½	4	⅝	68	**111/–**	**120/–**
G	6	2¼	12½	22½	11	4	¾	96	**124/–**	**134/–**
H	6	2¼	16	26	11	6	¾	110	**144/–**	**154/–**
I	8	2½	16	28	13	6	⅞	150	**195/–**	**208/–**
J	8	2½	20	32	13	6	⅞	170	**214/–**	**227/–**

Fig. 792. Retiring Jaw Machine Vice. Heavy duty type.

Similar to Fig. 790, but of more massive construction.

Size	2	....	4
Width of jaw, inches	5	....	8
Depth of jaw, inches	3	....	4
Admits work, inches	7	....	12
Length overall, inches	18½	....	25
Width, inches	9½	....	13
Weight, lbs.	76	....	170
Price each	**134/–**	....	**240/–**

Fig. 793. Improved "XL" Service Base Machine Vice.

Similar in design to above, but mounted on a swivel graduated base, turning a complete circle.

Width of jaws, inches	6	....	8
Depth of jaws, inches	2¼	....	2½
Admits work, inches	12	....	16
Weight, lbs.	115	....	185
Price each	**240/–**	....	**304/–**

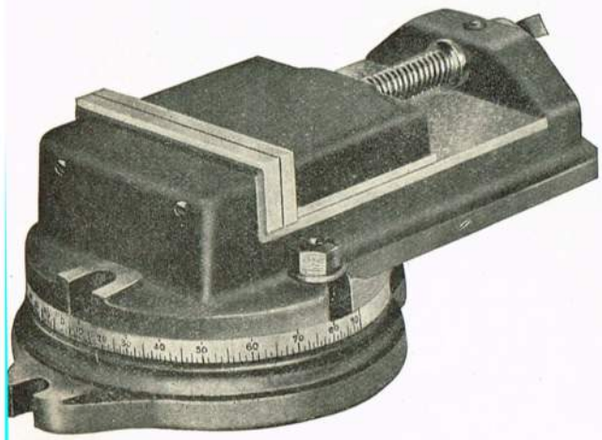

Fig. 794.

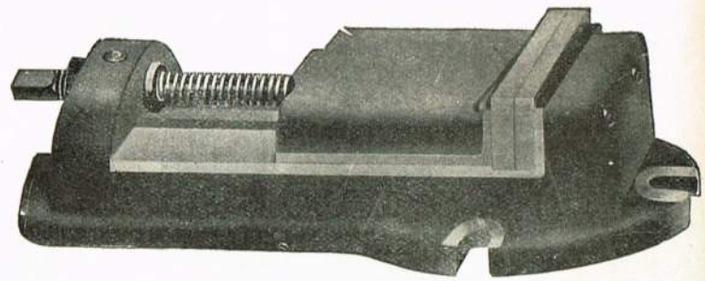

Fig. 795.

The vices are specially designed for precision work. Fig. 795 has a fixed screw to the sliding jaw; the screw is fitted with a square head. Fig. 794. the same model mounted upon an accurately graduated swivel base, turning a complete circle.

Size	Width of jaws inches	Depth of jaws inches	Admits work inches	Price each **Fig. 794**	Price each **Fig. 795**
A	3	1⅛	1¾	**100/–**	**85/–**
B	4¼	1¼	2¼	**135/–**	**110/–**
C	6	1¾	3⅝	**160/–**	**135/–**

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VICES AND V BLOCKS.

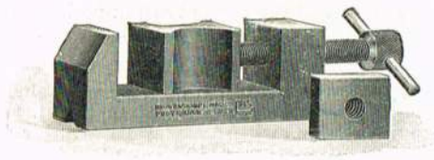

Fig. 797.

BROWN & SHARPE TOOLMAKERS' VICE.

2 inches.

For drilling, fitting and laying out work on surface plates. Drop-forged and case-hardened. The V groove on the under side of the base takes work from $^{9}/_{32}''$ to $^{11}/_{16}''$ diameter. Greatest capacity is 2″. Complete with two steel jaws, which slip on and off the screw.

Price ... ... **14/7** each.

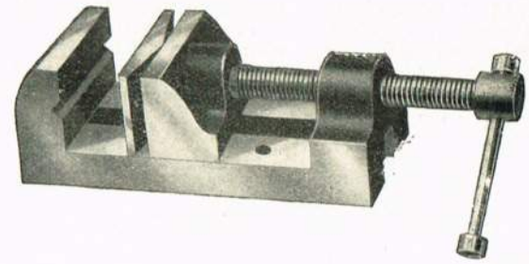

Fig. 798.

SMALL MACHINE VICES.

Provided with a removable swivel jaw, the fixed jaw being grooved to hold round work.

Width of jaws	Depth of jaws	Admits work	Size of base	Height	Price
$2\frac{3}{8}''$	$1\frac{3}{4}''$	$2\frac{7}{8}''$	$6'' \times 2\frac{3}{8}''$	2″	**12**/-

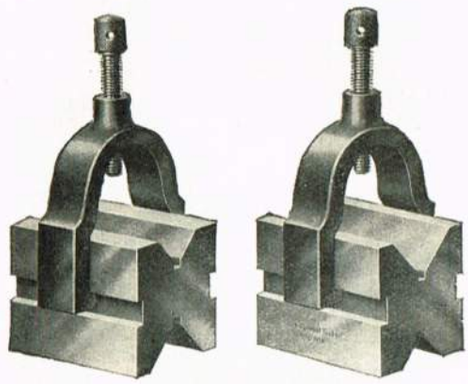

Fig. 799.

STEEL V BLOCKS AND CLAMPS.

Manufactured from tool steel, hardened and ground. A thoroughly reliable tool for precision work. The blocks are made in pairs and numbered to ensure perfect alignment. Are suitable for work up to 1″ diameter. Size $1\frac{1}{4}'' \times 1\frac{1}{4}'' \times 1\frac{5}{8}''$.

Price ... ... **25/5** per pair.

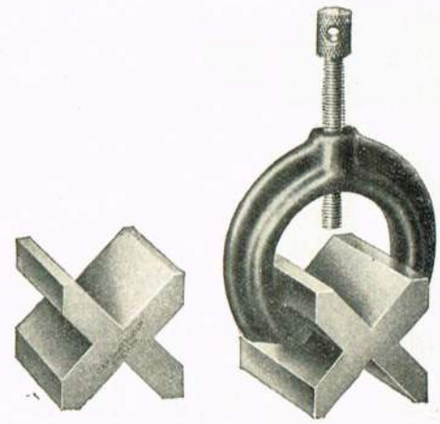

Fig. 800.

CAST IRON V BLOCKS AND CLAMPS.

Size $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times 2''$.

Made of high-grade cast iron, in pairs, suitable for holding work in position for pin punching, marking off, drilling, etc.

Blocks ... ... **4/9** per pair.
Clamps ... ... **2/3** each
Set complete **7**/-

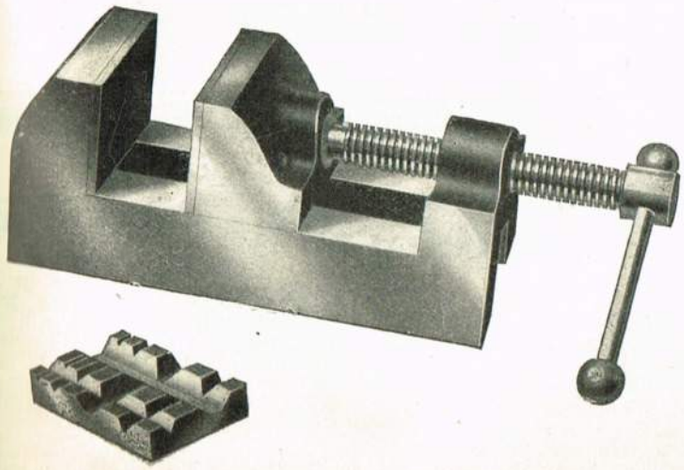

Fig. 802.

Provided with a hardened steel block, with V-shaped grooves, for holding various sizes of round or irregular-shaped work at any angle for drilling, etc.

The body and sliding jaws have hardened steel faces.

The screw is $\frac{5}{8}''$ steel, with Acme thread, and holds rigid any work within its capacity.

The base of vice may be made to order to any pattern at a small extra charge.

Width of Jaws	Depth of Jaws	Admit work	Size of Base	Height	Price
$2\frac{3}{4}''$	$1\frac{7}{8}''$	$3\frac{1}{8}''$	$7\frac{1}{4}'' \times ''2\frac{3}{4}$	3″	**25**/- each

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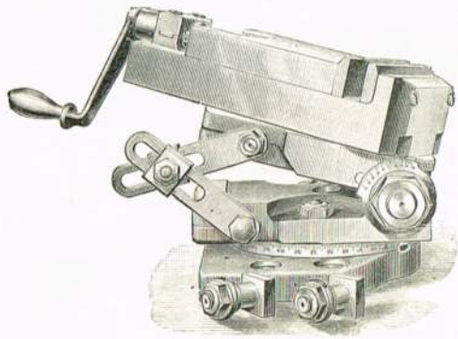
MACHINE BENCH & HAND VICES.

Fig. 803. Nos. 2T and 3T. BROWN & SHARPE UNIVERSAL TOOL-MAKERS' VICE.

The tool-makers Universal Vices are designed to meet the requirements of tool-makers and machine shops where a great variety of work is encountered. They are found of advantage in producing irregular or angular pieces and forms, as dies for sheet metal stamping and grinding forms, drop forgings, etc., also in determining and forming the edges for model parts of machines and work of a similar class. Often the vice will take the place of an expensive jig or fixture. It can be set at any angle and the work placed in position or removed without disturbing the setting. It can also be easily moved from one machine to another and several operations performed without removing the piece.



The base is double. The lower part is provided with a reversible tongue which can be used with either $\frac{5}{8}''$ or $\frac{3}{4}''$ slots. The base is fastened to the table by two bolts, which fit into the table T slots. It has two sets of bolt slots to allow for moving the vice back when set in a vertical plane. The upper part is a hinged knee, which swivels on the lower part of the base. The lower part of the knee is graduated and can be set at any angle in a horizontal plane. The upper part of the knee is hinged to the lower part in such a manner that it can be set at any angle to 90° in a vertical plane and clamped rigidly in position by the nut on end of bolt forming the hinge and the bracing levers, shown at left of cut, which are held in position by the bolt in the centre and the bolts at the end of the levers. The upper surface is graduated to degrees for setting the vice proper in a horizontal plane. The bolt forming the hinge is provided with a hardened steel dial graduated to 90°.

The vice proper swivels on the upper part of the hinged knee, can be set at any angle to the axis of the bolt forming the hinges and clamped in position.

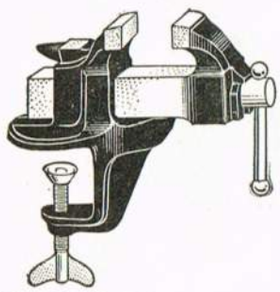
The jaws are of toolsteel, hardened and ground, unless otherwise specified. Each vice is furnished with a wrench.

Size	Width of jaws	Depth of jaws	Jaws open	Nett weight	Shipping weight	Price
No. 2T	$5\frac{1}{8}''$	$1\frac{1}{4}''$	$2\frac{3}{4}''$	65 lbs.	80 lbs.	**£17 5 10**
No. 3T	$6\frac{1}{8}''$	$1\frac{9}{16}''$	$3\frac{5}{8}''$	135 lbs.	160 lbs.	**£22 8 4**

Fig. 804. Cheap and Efficient Quick and Positive Action MACHINE VICE.

Manufactured in two sizes of malleable iron throughout, with bright mild steel screw with tommy bar head. Of heavy design. Carefully machined throughout. Hardened steel jaws.

Size	Width of jaws	Jaws admit	Depth of jaw	Price each
A	$1\frac{5}{8}''$	$2\frac{3}{8}''$	$\frac{3}{4}''$	**16/–**
B	$4''$	$6''$	$1\frac{1}{2}''$	**60/–**

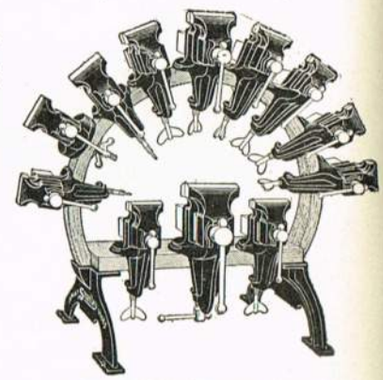


Nos. 741 to 763.

Fig. 805. STANLEY "VICTOR" VICES.

are manufactured expressly for jewellers and fine bench work generally. Well made, strong, screw made from cold rolled steel, and fitted with patent split thrust washer. Prices are given with iron or steel jaws.

No.	Fitted with iron jaws Price each	No.	Fitted with steel jaws Price each	Width of jaws inches	Weight lbs. each
741	**6/9**	761	**8/6**	$1\frac{1}{2}$	3
742	**8/–**	762	**9/9**	$1\frac{3}{4}$	$3\frac{1}{4}$
743	**9/6**	763	**11/6**	2	$3\frac{1}{2}$
744	**11/3**	764	**13/3**	$2\frac{1}{4}$	4
745	**13/3**	765	**15/9**	$2\frac{1}{2}$	5
746	**20/6**	766	**23/–**	3	$8\frac{3}{4}$



Assorted "Victor" Vices.

PRICES AND PARTICULARS OF "VICTOR" VICES ASSORTED.

Mounted complete upon a stand which is a most effective salesman for stores, ironmongers, etc.

Assortment **No. 12**, consisting of 12 vices—2 each Nos. 741, 742; 1 each Nos. 743, 744, 745, 746, 752, 761, 763, 772 and stand. Weight complete, 65 lbs. Price **131/3** each.

Assortment **No. 18**, consisting of 13 vices—Nos. 741, 742, 743, 744, 745; 1 each, 746, 752, 753, 763, 764, 765, 772, 773 and stand. Weight complete, 85 lbs. Price **208/9** each.

Other assortments can be supplied. Particulars and prices on application.

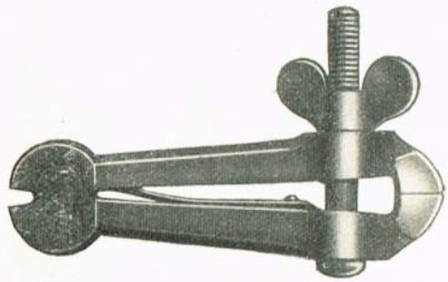


Fig. 806.

BEST WROUGHT STEEL HAND VICES,

with hardened jaws and wing nut.
Warranted.

No.	1	2	3	4	5	6	7	8	9
Width of jaws, inches	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7
Price each	**3/8**	**4/-**	**4/4**	**5/-**	**6/8**	**8/-**	**11/4**	**14/5**	**17/6**

Fig. 807. STARRETT PIN VICES, No. 162.

These vices have hardened jaws with chucks so made that they will hold firmly anything inserted in them. The hole extends through full length of the knurled handle. The handle is reduced in size, so that it may be more rapidly rotated between thumb and finger when filing small work. They are convenient handles for holding scribers, small files, taps, etc. Nickel-plated.

PRICES.

No.	Capacity		No.	Capacity	
162A	·0″ to ·040″ ...	**3/–**	162C	·050″ to ·125″ ...	**3/–**
162B	·030″ to ·062″ ...	**3/–**	162D	·115″ to ·187″ ...	**3/9**

Set complete (one of each size) ... **12/3**

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VICES.

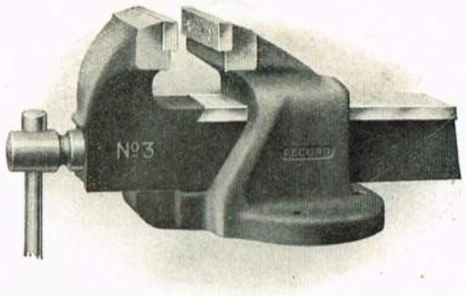

Fig. 808. Nos. 00 to 8, and
Fig. 808a. Nos. 0S to 8S with swivel base.

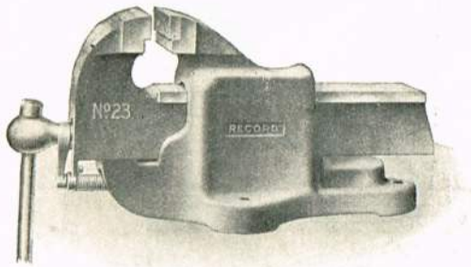

Fig. 809. Nos. 21 to 28.

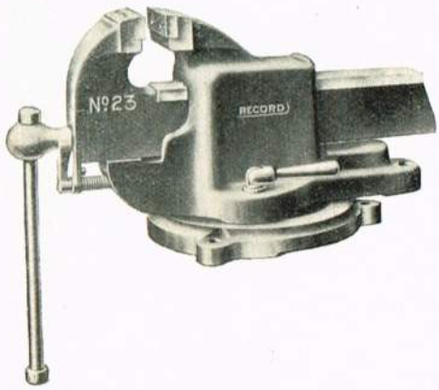

Fig. 810. Nos. 21S to 28S, with swivel base.

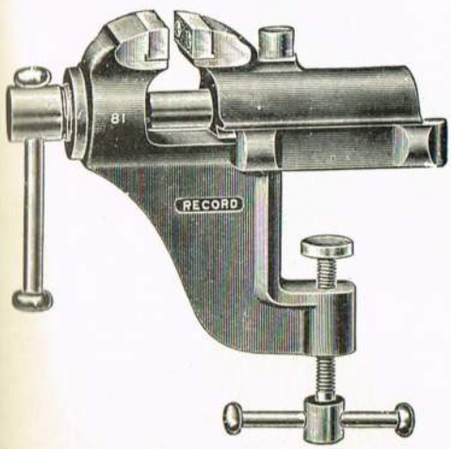

Fig. 812. Nos. 81 and 62.

Fig. 808. "Record" Mechanics' Vices.

"Record" Mechanics' Vices have been carefully designed to give the maximum of strength and utility, and our thorough system of inspection at every process of manufacture guarantees satisfaction to the users of the vices, and warrants the confidence of all who handle them. Mild steel screws, jaw plates hardened steel, body of best cast iron.

Vice No.	....	....	....	00	0	1	2	3
Width of jaws	....	....	ins.	2¼	2½	3	3½	4
Maximum opening	....	....	ins.	2¼	2⅝	3¼	4	4¾
Depth of jaws	....	....	ins.	1½	1⅝	1⅞	2⅜	2¾
Weight, approx.	....	....	lbs.	5½	7	12	20	30
Price each....	....	....	....	**14/6**	**16/–**	**19/–**	**26/–**	**35/–**

Vice No.	....	....	....	4	5	6	7	8
Width of jaws	....	....	ins.	4½	5	6	7	8
Maximum opening	....	....	ins.	5½	6½	8	9	9
Depth of jaws	....	....	ins.	3	3¼	3½	4	4
Weight, approx.	....	....	lbs.	40	56	72	90	94
Price each....	....	....	....	**44/–**	**57/–**	**74/–**	**86/–**	**95/–**

Fig. 809. "Record" Quick-Grip Pattern Fitters' Vice.

A most popular pattern at comparatively low cost; well proportioned, exceptionally strong tool. The quick-grip action eliminates unnecessary turning of the screw in opening and closing the vice.

Vfce No.	....	....	21	22	23	24
Width of jaws	....	....	3¼	3¾	4¼	5¼
Maximum opening		ins.	4	5¼	6½	7
Depth of jaws	....	ins.	2⅜	3⅛	3⅜	3⅞
Weight, approx.	....	lbs.	30	45	60	75
Price each....	....	....	**46/–**	**56/–**	**66/–**	**80/–**

Vice No.	....	....	....	25	27	28
Width of jaws	....	....	ins.	6	7	8
Maximum opening		....	ins.	8	9	10
Depth of Jaws	....	....	ins.	4½	5	6
Weight, approx.	....	....	ins.	90	112	180
Price each....	....	....	lbs.	**94/–**	**125/–**	**180/-**

Fig. 808a. "Record" Mechanics' Vice on Swivel Base.

Vice No.	....	....	....	0S	1S	2S	3S	4S
Width of jaws	....	....	ins.	2½	3	3½	4	4½
Maximum opening			ins.	2⅝	3¼	4	4¾	5½
Depth of jaws	....	....	ins.	1⅝	1⅞	2⅜	2¾	3
Weight, approx.	....	....	lbs.	10	16	25	36	50
Price each....	....	....	....	**22/–**	**27/–**	**36/–**	**48/–**	**60/–**

Vice No.	....	....	....	5S	6S	7S	8S
Width of jaws	....	....	ins.	5	6	7	8
Maximum opening		....	ins.	6½	8	9	9
Depth of jaws	....	....	ins.	3¼	3½	4	4
Weight, approx.	....	....	lbs.	80	94	112	116
Price each....	....	....	....	**75/–**	**92/–**	**104/–**	**114/–**

Fig. 810. "Record" Quick-Grip Pattern on Swivel Base.

Mounted on improved pattern. Guaranteed strength and rigidity. Nut made of malleable iron is unbreakable under working conditions.

Vice No.	....	....	21S	22S	23S	24S	25S	27S
Width of jaws	....	ins.	3¼	3¾	4¼	5¼	6	7
Maximum opening		ins.	4	5¼	6½	7	8	9
Depth of jaws	....	ins.	2⅜	3⅛	3⅜	3⅞	4½	5
Weight, approx.	....	lbs.	40	60	75	97	114	140
Price each....	....	....	**60/–**	**70/–**	**80/–**	**98/–**	**112/–**	**150/–**

Figs. 811/2.

"Record" Small Vices.

Made like a gun. Serviceable. High-grade vice, recommended for watchmakers, jewellers, tool makers, etc.

Nos.	....	....	....	71	72
Width of jaws		ins.		1¾	2⅜
Maximum opening		ins.		1¾	2⅜
Weight approx.		lbs.		2¼	4
Price each	....	....		**12/–**	**15/–**
Nos.	....	....	....	81	82
Width of jaws		ins.		1¾	2½
Maximum opening		ins.		1¾	2⅜
Weight approx.		lbs.		3	5½
Price each	....	....		**14/–**	**17/6**

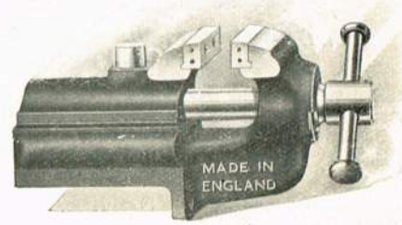

Fig. 811. No. 71 and 72.

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VICES.

Fig. 815. "Perfect" Vice. Model F.
Cast iron body. Mild steel screw. Quick-grip action. (Nos. 5 to 9A).

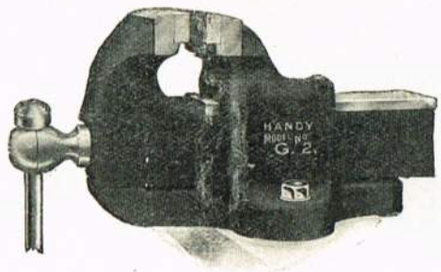

Fig. 816. "Perfect" Vice
"Handy" Series. Model G.
Plain screw pattern (Nos. 0A to 3C).

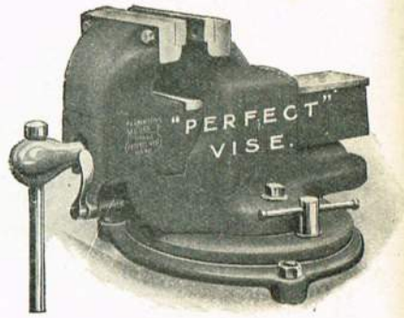

Fig. 817. "Perfect" Vice.
Quick-grip action. Mounted on Swivel base. (Nos. 5S to 9AS).

No.	0A	1A	1	2	3	3A	3B	3C	5	6	7
Width of jaw, inches	2¼	2½	3	3½	4	4½	5	6	3¼	3¾	4¼
Depth of jaw, inches	1½	1⅝	1⅞	2⅜	2¾	2⅞	3⅛	3½	2⅜	3	3⅜
Maximum opening of jaws, inches	2	2½	3	3½	4	5	6	8	4	5	6
Weight, lbs.	5½	7¼	12	19½	32	42	56	72	30½	44	60
Price each	**12/–**	**13/3**	**16/–**	**22/–**	**29/6**	**36/–**	**46/6**	**62/–**	**35/–**	**42/–**	**49/–**

No.	8	8A	9	9A	5S	6S	7S	8S	8AS	9S	9AS
Width of jaw, inches	5¼	6	6½	7½	3¼	3¾	4¼	5¼	6	6½	7½
Depth of jaw, inches	3¾	4⅛	4½	5	2⅜	3	3⅜	3¾	4⅛	4½	5
Maximum opening of jaws, inches	7	8	9	10	4	5	6	7	8	9	10
Weight, lbs.	74	92	112	148	41½	60	78	97	118	141	183
Price each	**60/–**	**70/–**	**80/–**	**100/–**	**45/6**	**54/6**	**64/–**	**78/–**	**90/–**	**103/–**	**127/–**

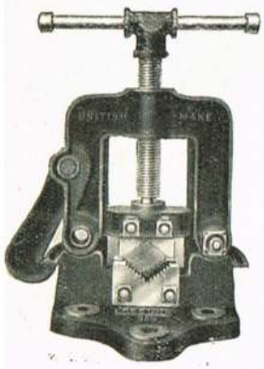

Fig. 818. British-made Self-Locking Hinged Pipe Vice.

Made of best malleable iron, and fitted with steel screw and handle. Jaws machined from tool steel, carefully hardened and tested. The frame is reversible, and the vice can be operated either left or right-hand, and all parts are interchangeable.

Vice No.	91¼	91½	92	92½	93½	94½	96
Pipe capacity, ins.	⅛ to 1¼	⅛ to 1½	⅛ to 2	⅛ to 2½	⅛ to 3½	⅛ to 4½	⅛ to 6
Weight, lbs.	3	5	7½	10	16	25	40
Price	**10/6**	**15/–**	**17/9**	**20/9**	**31/3**	**45/9**	**98/–**

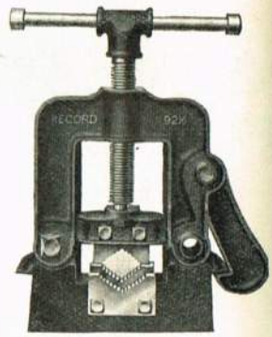

Fig. 819.

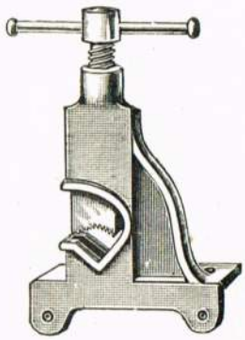

Fig. 820.

Pipe Vice.

The above are light tube vices. Open-sided pattern, flat foot pattern and side flange pattern. Malleable iron body. Steel screw and handle. Hardened steel jaws. Both patterns are the same price.

No.	1	1A	2
Pipe capacity, inches	⅛ to 1	⅛ to 1½	¼ to 2
Weight, lbs.	5	10	13
Price each	**12/–**	**16/6**	**20/6**

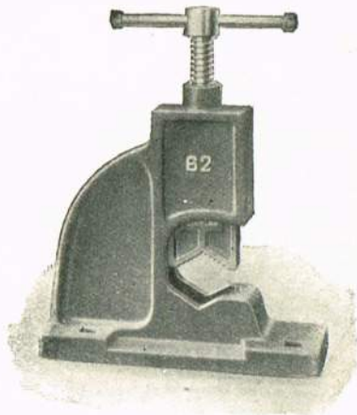

Fig. 821. Pipe Vice. Solid Open side pattern, cast iron body. Steel screw and handle, hardened jaws.

No.	61	62	63	64	66
Pipe capacity, ins.	⅛ to 1¼	¼ to 2	¼ to 3	¼ to 4	1 to 6
Weight, lbs.	14	30	40	70	136
Price each	**16/–**	**25/–**	**36/–**	**50/–**	**100/–**

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VICES (STEEL)

Guaranteed unbreakable under working conditions.

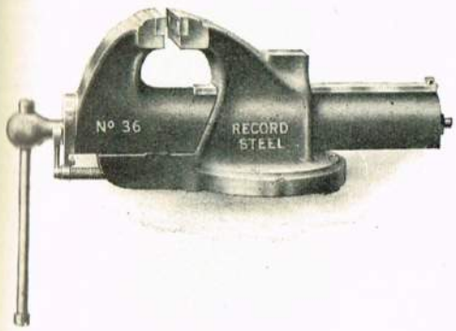

Fig. 822. Nos. 34P to 36 P. Plain screw.
Fig. 823. Nos. 34 to 36 (as illustrated).

Fig. 822.

Stationary base. Plain screw.

No.	34P	35P	36P
Width of jaws, inches	$4\frac{1}{2}$	$5\frac{1}{4}$	6
Maximum opening, inches	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{3}{4}$
Depth of jaws, inches	3	$3\frac{1}{2}$	4
Approximate weight, lbs.	35	48	65
Price each	**85**/–	**104**/–	**128**/–

Fig. 823. Steel Vice.

Quick-Grip pattern as illustrated. Jaws stop at suitable angle.

No.	34	35	36
Width of jaws, inches	$4\frac{1}{2}$	$5\frac{1}{4}$	6
Maximum opening, inches	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{3}{4}$
Depth of jaws, inches	3	$3\frac{1}{2}$	4
Approximate weight, lbs.	35	48	65
Price each	**88**/–	**108**/–	**132**/–

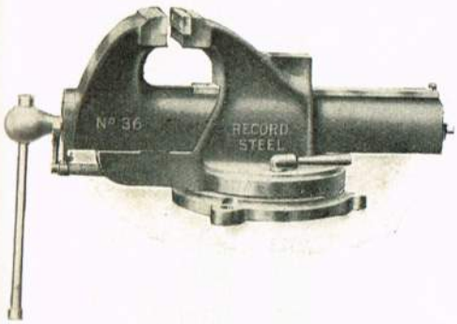

Fig. 824. No. 36.

Fig. 824. Steel Vice.

As Fig. 823, Quick-Grip pattern, but mounted on improved design quick-action swivel base, as illustrated.

No.	34S	35S	36S
Width of jaws, inches	$4\frac{1}{2}$	$5\frac{1}{4}$	6
Maximum opening, inches	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{3}{4}$
Depth of jaws, inches	3	$3\frac{1}{2}$	4
Approximate weight, lbs.	45	59	77
Price each	**104**/–	**126**/–	**154**/–

Fig. 825. Steel Vice.

As Fig. 822, plain screw, but on improved swivel base.

No.	34PS	35PS	36PS
Width of jaws, inches	$4\frac{1}{2}$	$5\frac{1}{4}$	6
Maximum opening, inches	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{3}{4}$
Depth of jaws, inches	3	$3\frac{1}{2}$	4
Approximate weight, lbs.	45	59	77
Price each	**101**/–	**122**/–	**150**/–

Fig. 826. No. 46.

Fig. 826. "Record" Heavy Duty Vice.

Great strength. Designed for rough and heavy work. Plain screw type.

No.	46	48	49
Width of jaws, inches	6	8	10
Maximum opening, inches	$4\frac{1}{2}$	$5\frac{3}{8}$	$5\frac{3}{8}$
Depth of jaws, inches	10	12	12
Approximate weight, lbs.	125	240	250
Price each	**120**/–	**260**/–	**300**/–

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VICES AND VICE STANDS.

Fig. 830.

Handy Portable Vice Stand.

Specially suitable for contractors and railway use.

No.	1	2	3
Size vice supplied inches	3½	4½	6
Price each	**90**/–	**100**/–	**117/6**

Mounted on wheels, **15/6** extra.

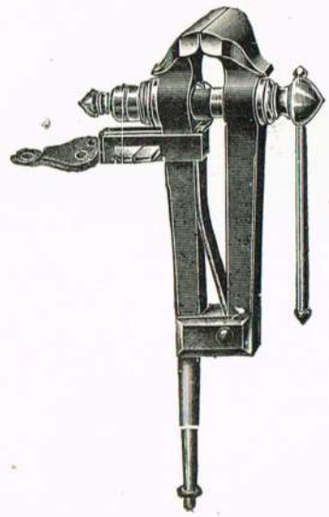

Fig. 831.

Best Quality Wrought Steel Solid **Box Staple Vice.**

Approximate weight of sizes :

Size of jaws, ins.	3	3½	4	4½
Weight, lbs.	30	40	48	60
Size of jaws, ins.	5	5½	6	7
Weight, lbs.	84	95	112	140

Price . **90**/– per cwt.
All under 50 lbs. charged as 50 lbs.

Fig. 832.

Telescopic Portable Stand.

The column is telescopic, and by means of a small jack screw the height of table may be varied to suit special requirements of work or workman.

22 inch Square Table, weight 224 lbs.
Price (without vice), **96**/– each.

PORTABLE VICE STANDS

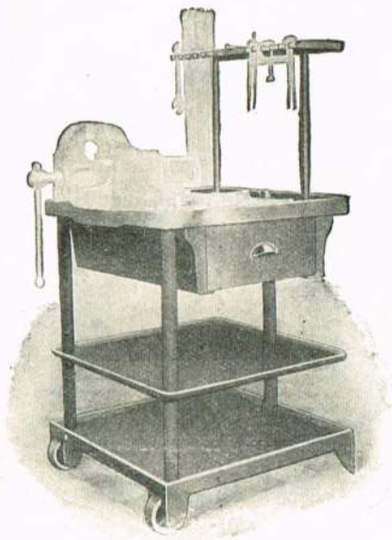

Fig. 833.

Three-Decker Portable Stand, mounted on three wheels.

. rack is fitted for holding 10 files ; also tray for small articles.
22 inch Square Table, weight with drawer 300 lbs.

Height of table, 30 inches. Vices and accessories extra.
Prices, with drawer, **138**/– each ; without drawer, **120**/– each.

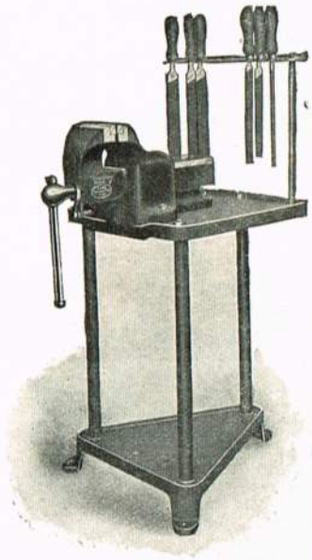

Fig. 834.

This stand is intended for use in confined spaces, among machines, lathes, etc.

A rack is fitted for holding eight files, also a tray for small articles. The base serves as a shelf.

Diameter of table, 18 × 19 inches. Height to top of table, 30 inches.
Weight with drawer, 112 lbs. Vices and accessories extra.
Prices, with drawer, **64**/– · without drawer, **48**/– each.

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BENCH SCREWS, CRAMPS.

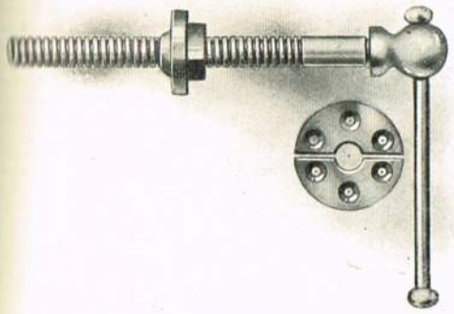

Fig. 840. "Record" Steel Bench Screws.

Length, inches	16	18	20	22
Diam. of screw inches	1	1⅛	1¼	1½
Price each	**10/6**	**14/–**	**16/–**	**25/–**

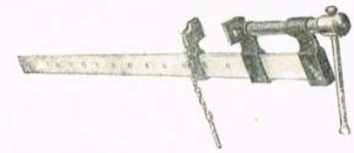

Fig. 841. "Record" Sash Cramp. Model No. 135.

Bright steel bar, 1¼″ × ¼″. Square edge. Jaws 2″ deep.

Length, inches	24	30	36	42	48
Capacity, inches	18	24	30	36	42
Price each	**15/–**	**15/6**	**16/–**	**16/6**	**17/–**

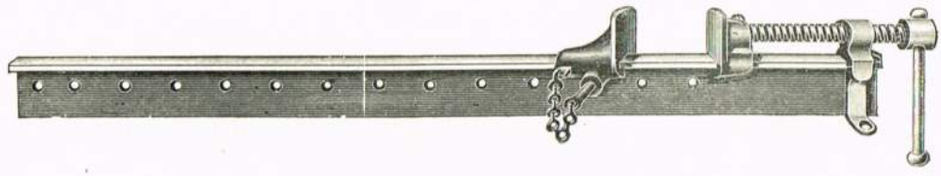

Fig. 842. "Record" T-Bar Cramps. Steel bar and screw. Malleable iron jaws.

	Prices of Light Model 136.								Prices of Heavy Model 138.								
Length of bar, inches	24	30	36	42	48	54	60	....	36	42	48	54	60	66	72	78	84
Capacity	18	24	30	36	42	48	54	....	30	36	42	48	54	60	66	72	78
Price each	**22/–**	**23/–**	**24/–**	**25/–**	**26/–**	**27/–**	**28/–**	....	**33/–**	**34/6**	**36/–**	**37/6**	**39/–**	**40/6**	**42/–**	**43/–**	**45/–**
Lengthening bar inches	24	30	36	42	48	54	60	....	30	36	42	48	54	60	66	72	
Price of lengthening bar extra each	**11/6**	**12/6**	**13/6**	**14/6**	**15/6**	**16/6**	**17/6**	....	**15/–**	**16/6**	**18/–**	**19/6**	**21/–**	**22/–**	**24/–**	**25/6**	

Light Model—Full size section.

Heavy Model—Full size section.

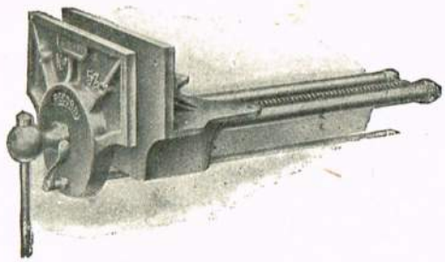

Fig. 843. "Record" Woodworker's Vice.

For joiners, patternmakers, etc.
Made of tough cast iron. Slides of bright polished steel. Fitted with quick-release action.

Size No.	Width of jaws inches	Opening inches	Weight lbs.	Price each
52	7	7	16	**28/–**
52½	9	12	28	**38/–**
53	10½	12	30	**40/–**

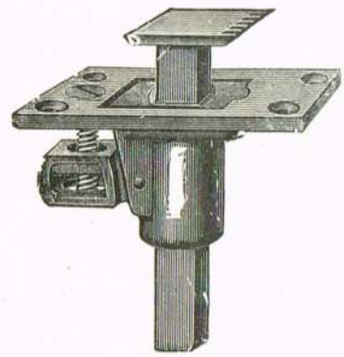

Fig. 844.

Merrill's Pattern Bench Stop.

Malleable iron body, mild steel screw and slide, with steel top.

Price .... **45/–** per doz.

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JOINERS' CRAMPS.

Fig. 845. INSTANT RACK ADJUSTING CRAMPS.

Steel bars. Best malleable jaws. Wrought screws. Black.
Section of bars, $2\frac{5}{8}'' \times \frac{7}{8}'' \times \frac{5}{16}''$. Depth of jaws. $2\frac{1}{2}''$.

Length overall, feet	3′	3′ 6″	4′	4′ 6″	5′	5′ 6″	6′	7′	8′
To take in about	2′ 4″	2′ 10″	3′ 4″	3′ 10″	4′ 4″	4′ 10″	5′ 4″	6′ 4″	7′ 4″
Price each	**31/–**	**31/3**	**31/6**	**32/–**	**34/–**	**35/6**	**36/6**	**38/–**	**40/–**
Lengthening bars, price each...	**13/–**	—	**14/–**	—	**14/9**	—	—	—	—

Fig. 846. RACK ADJUSTING CRAMPS.

Steel bars. Section $2'' \times \frac{7}{16}''$ ″. Depth of jaws, $4\frac{3}{8}''$.

Length overall, feet	3′	3′ 6″	4′	4′ 6″	5′	5′ 6″	6′	7′	8′
To take in about	2′ 2″	2′ 8″	3′ 2″	3′ 8″	4′ 2″	4′ 8″	5′ 2″	6′ 2″	7′ 2″
Price each	**29/6**	**30/6**	**31/–**	**32/–**	**33/–**	**33/6**	**34/6**	**36/6**	**38/–**
Lengthening bars, price each...	**11/3**	—	**12/3**	—	**13/–**	—	—	—	—

Fig. 847. SASH BARS.

	Section, $1\frac{1}{8}'' \times \frac{1}{4}''$. Depth of jaws, $1\frac{7}{8}''$.						Section, $1\frac{1}{2}'' \times \frac{5}{16}''$. Depth of jaws, $2\frac{3}{4}''$.					
Length overall, inches ...	18	24	30	36	42	...	30	36	42	48	54	60
Take in about, inches ...	12	18	24	30	36	...	24	30	36	42	48	54
Price each	**10/6**	**10/6**	**10/9**	**11/3**	**11/6**	...	**16/6**	**17/3**	**17/9**	**18/3**	**18/6**	**19/–**

Fig. 848. SASH BARS.

Section, $1\frac{1}{4}'' \times \frac{1}{4}''$. Depth of jaws, $1\frac{3}{4}''$.

Length overall, inches	24	30	36	42	48
Take in about	18	24	30	36	42
Price each	**13/–**	**13/6**	**14/3**	**14/6**	**14/9**

Sizes of Joiners' Cramps and Sash Bars not listed quoted for upon application.

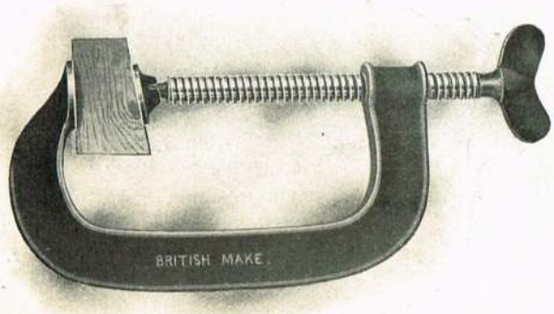

Fig. 849. Record "G" Cramps.
Ribbed type.

Prices and Sizes of Fig. 849 "G" Cramps.

Well made, with malleable iron frame, mild steel screw, machine-cut square thread. A swivel shoe is provided which locates itself to any angle. Invaluable to joiners, fitters, cabinetmakers, wagon builders, etc.

Capacity, inches	2	3	4	5
Price per dozen	**30/–**	**36/–**	**48/–**	**60/–**
Capacity, inches	6	8	10	12
Price per dozen	**72/–**	**96/–**	**120/–**	**144/–**

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CRAMPS.

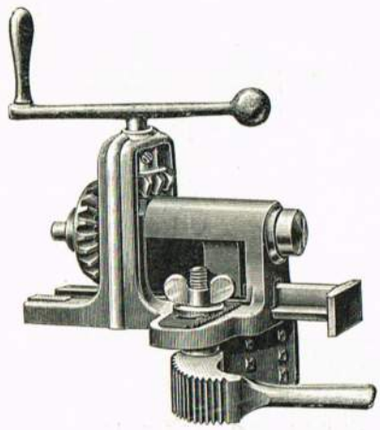

Fig. 860. "Record" Flooring Cramp.

No. 151. Top Action Model. Cast iron body, malleable iron fittings, steel screw, approximate weight 27 lbs.

No.	1	2	3
To suit Joists ...	1½ to 3½	1½ to 4½	1½ to 6 inches.
Price each ...	30/–	31/–	32/–

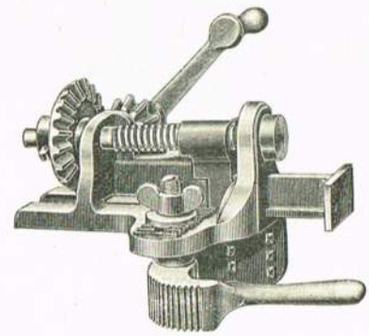

Fig. 861. "Record" Flooring Cramp.

No. 150. Side Action Model. Cast iron body, malleable iron fittings, steel screw, approximate weight 24 lbs.

No.	1	2	3
To suit Joists ...	1½ to 3½	1½ to 4½	1½ to 6 inches.
Price each ...	28/–	29/–	30/–

These are drop-forged from a strong tough grade of carefully selected steel, and their form is such as to utilize the metal to the greatest advantage.

They are subjected to a refining process, or heat treatment, after forging, which increases their stiffness and strength and reduces the liability of springing; they are the strongest "C" clamp on the market.

In respective order as per table, the minimum capacities of clamps with Standard Screws are approximately as follows: 0, 0, 11/16, ⅞, 1 5/16, 2, 2½, 3 1/16, 4¼, 6⅜, 7⅝. If Long Screws are used, the maximum capacity of all clamps will be 0.

Fig. 850. Vulcan Heavy Duty "G" Cramps.

Size No.	Capacity	Depth of throat from centre of Screw	Extreme Dimensions of Body: Length	Extreme Dimensions of Body: Width	Standard Screw: Diam.	Standard Screw: Length under Head	Approx. weight each lbs.	Extra Std. each	Price. Screws Long each	Clamp Complete with Std. Screw
0	¾	¾	2¼	2	5/16	1½	¼	–/5	—	2/1
1	1¼	1⅛	3¼	2¾	⅜	2¼	¾	–/6	—	3/1½
1½	1¾	1½	4¼	3⅝	½	2¼	1½	–/7	1/8	5/2½
2	2¼	1¾	5½	4½	⅝	2⅞	3⅛	–/10	2/5	7/3½
3	3¼	2⅜	7¼	5¾	¾	3¾	6½	–/2	3/3	10/5
4	4½	2¾	8⅞	6½	⅞	4½	9⅝	1/7	4/2	13/6½
5	5½	3⅛	10⅜	7	⅞	5⅜	12¼	2/1	5/2½	16/8
6	6½	3⅜	12	7⅞	1	5⅞	16½	2/8½	6/5½	20/10
8	8½	3¾	14⅜	8½	1⅛	7	24	3/6½	8/9	29/2
10½	10½	4⅛	16⅞	9	1⅛	7	28	3/6½	10/7½	39/7
12½	12½	4½	19⅜	9¾	1¼	8	40	5/–	15/–	52/1

Fig. 851. Coachmakers' Cramps.

Manufactured from finest materials. A cramp that can be relied upon to give excellent service. Best wrought iron. Bright mild steel screw and handle.

Open, inches	8	10	12	14	16	18	20	22
Diam. of screw, inches	1	1	1⅛	1⅛	1¼	1¼	1⅜	1⅜
Price each	24/6	25/–	31/9	36/–	43/–	45/3	60/9	62/3

Fig. 852. Best Wrought Iron Boilermakers' Cramp.

Made from finest materials. Hand-wrought frame with mild steel screws, the ends of the screws fitted with hardened points.

Capacity, inches	2	3	4	5	6
Section, inches	2×¾	2½×¾	2½×1	2½×1	3×1
Price each	14/6	17/–	20/9	23/9	29/9

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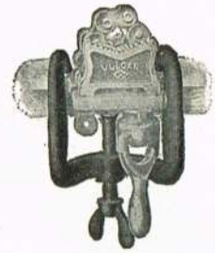
PIPE VICES AND CUTTERS.



. 862. Drop Forged Chain Pipe Vice. Hardened Steel Jaws. All parts interchangeable.

Price, Vice and Extra Parts.

ze. For Pipe, Sizes.	Jaws, pair.	Chain with Screw.	Screw.	Handle and Nut.	Nut	Vice, Complete.
$\frac{1}{8}$ to 2	**6/3**	**5/3**	**1/8**	**4/7**	**2/11**	**14/7**
$\frac{1}{4}$ to 4	**14/7**	**10/–**	**2/11**	**8/9**	**5/8**	**31/3**
$\frac{3}{4}$ to 8	**37/6**	**25/10**	**5/3**	**14/7**	**8/4**	**75/–**

Fig. 862A. Pipe Vice Clamp. Drop forged from a strong, tough grade of carefully selected steel, provided with wrought steel Screw and Swivel and subjected to a special refining process or heat treatment which further increases its stiffness and strength, this Clamp eminently completes the extreme usefulness of the No. 1 "Vulcan" Chain Pipe Vice.

Applicable for fastening to Sill, Table, Bench or Chair, etc., it is a valuable clamping device under conditions where other methods are impracticable.

No. 1—For No. 1 "Vulcan" Vice. Length $5\frac{1}{8}$in., Width $4\frac{3}{4}$in. Size Screw $\frac{1}{2} \times 3\frac{5}{8}$in. Price, complete Clamp, **7/3½**. Extra Screw and Swivel not assembled, **2/1.**

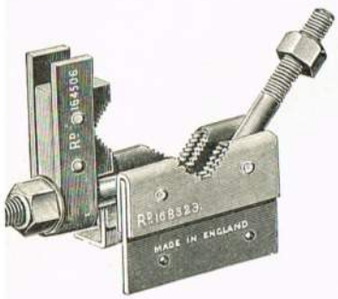
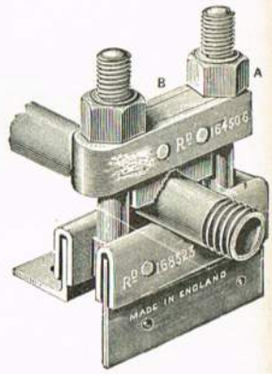


Fig. 863. Black Wrought Steel Pipe Vice.

Light and strong.

Size.	Weight.	Capacity.	Price each.
0 Pocket Size	13 ozs.	$\frac{1}{8}$"—$\frac{3}{4}$" pipes	**6/6**
1	$4\frac{1}{2}$ lbs.	$\frac{1}{8}$"—$1\frac{1}{2}$" pipes	**14/–**
2	7 lbs.	$\frac{1}{4}$"—2" ,,	**22/–**
3	14 lbs.	$\frac{1}{2}$"—3" ,,	**37/6**
4	21 lbs.	$\frac{1}{2}$"—4" ,,	**42/9**
5	36 lbs.	$\frac{1}{2}$"—$5\frac{1}{2}$" ,,	**97/6**



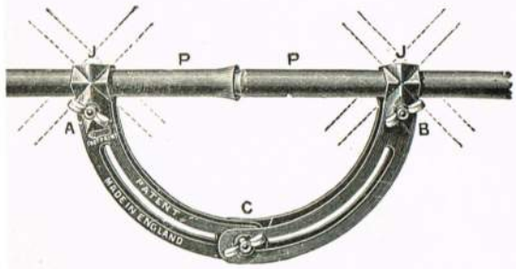


Fig. 864. Pipe Clamps or Soldering Vice. For jointing lead, compo, brass and copper pipes, and brazing cycle frames. These arms can be adjusted to give a great variety of positions.

Size 1.—Pipe Clamp, 9" long, $4\frac{1}{2}$" wide when closed, weight $1\frac{1}{2}$ lb. for pipes up to $1\frac{1}{2}$ inch diameter, **5/6** each.

Size 2.—Pipe Clamp, $5\frac{1}{2}$" long, $2\frac{1}{4}$" wide when closed, weight 6 ozs., for pipes up to $\frac{3}{4}$ inch diameter, **4/3** each.

Fig. 865. Wrought Steel Pipe Cutters.

No. 1. 14" long, weight $3\frac{1}{4}$ lbs. cut pipes $\frac{1}{8}$" to $1\frac{1}{4}$". Price **27/9** each.

No. 2. 20" long, weight $6\frac{1}{2}$ lbs. cut pipes 1" to 2". Price **39/6** each.

No. 2 will cut tubes smaller than 1", but is not so handy for small pipes.

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WRENCHES.

Fig. 866. "STILLSON" WRENCHES. Wood Handles.

Size when open, ins.	6	8	10	14
Pipe capacity, inches	⅛ to ½	⅛ to ¾	⅛ to 1	⅛ to 1½
Price each... ...	**8/6**	**9/6**	**10/6**	**14/6**

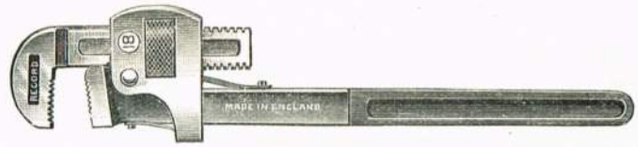

Fig. 867. "STILLSON" WRENCHES. Steel Handles.

Size when open inches	10	14	18	24	36	48
Pipe capacity inches	¼ to 1	¼ to 1½	¼ to 2	¼ to 2½	¼ to 3½	1 to 5
Price each...	**10/6**	**14/6**	**21/-**	**30/-**	**36/-**	**83/-**

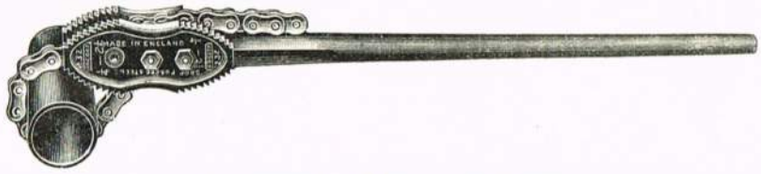

Fig. 868. TWO-JAW CHAIN PIPE WRENCH.

These Chain Pipe Wrenches are drop-forged. The teeth can be sharpened by filing like an ordinary hand saw. The flat links are hand-made from steel. All parts are interchangeable.

Two-jaw chain pipe wrench .... No.	230	231	232	233	233½	234	235	—
Capacity, inches	⅛ to ¾	⅛ to 1½	¼ to 2½	¾ to 4	1 to 6	1½ to 8	2 to 12	4 to 18
Length, inches	13¾	20	27	37	44½	50½	64½	87
Weight, lbs.	1¾	5¾	10	16	24	31	50	137
Breaking strain of chain, lbs.	3600	6700	9800	12500	14300	15700	21800	40000
Price each	**10/5**	**14/7**	**20/10**	**29/2**	**37/6**	**45/10**	**75/-**	**166/8**
Extra chain	**2/6**	**4/-**	**5/-**	**6/9**	**11/-**	**16/-**	**23/9**	**63/-**
Jaws, per pair, either pattern	**2/2**	**3/8**	**6/3**	**9/8**	**11/5**	**13/-**	**17/10**	**43/-**

Fig. 869. DROP-FORGED CHAIN PIPE AND FITTINGS WRENCH.

With single jaw and cable chain for fittings. Reversible jaws.

No.	41	42	43	43½	44	45
Capacity, inches	⅛ to 1½	¼ to 2½	¾ to 4	1 to 6	1½ to 8	2 to 12
Length, inches	20	27	37	44½	50½	64½
Weight, lbs.	5¾	10	16	24	31	50
Breaking strain of chain. lbs.	6700	9800	12500	14300	15700	21800
Price each	**14/7**	**20/10**	**29/2**	**37/6**	**45/10**	**75/-**
Extra chain	**4/-**	**5/-**	**6/9**	**11/-**	**16/-**	**23/9**
Extra jaws	**3/8**	**6/3**	**9/8**	**11/5**	**13/-**	**17/10**

Fig. 870. SOLID WROUGHT GUARANTEED QUALITY PIPE TONGS.

Size ...	A	B	C	D	E	F	G	H	I	J	K
Capacity ...	¼	⅜	½	¾	1	1¼	1½	1¾	2	2¼	2½
Price per doz.	**27/-**	**34/-**	**40/-**	**50/-**	**58/-**	**70/-**	**82/-**	**90/-**	**100/-**	**115/-**	**128/-**

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PIPE CUTTERS.

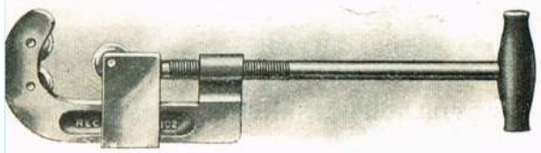

Fig. 871. (Nos. 101 and 102).

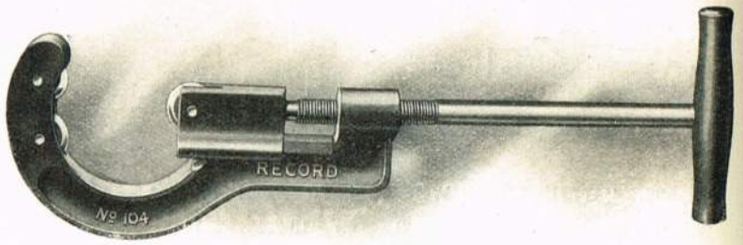

Fig. 872. (Nos. 103 and 104).

BRITISH-MADE PIPE CUTTERS (Barnes Type).

The body is a drop-forging. Bar of best bright steel, with finest tool steel cutters. All parts are tested before leaving works and are interchangeable.

No.	101	102	103	104	
Capacity, pipe	⅛ to 1	½ to 2	1½ to 3	2½ to 4	inches
Weight	3	4½	8½	14	lbs.
Price each	**18/9**	**25/–**	**42/–**	**84/–**	each
Extra wheels, dozen	**12/6**	**15/-**	**20/-**	**25/-**	per dozen
Extra pins, dozen	**4/3**	**4/3**	**4/3**	**8/3**	,, ,,

Fig. 873. **THREE-WHEEL PATTERN TUBE CUTTER.**

Forged head. Best cast steel cutter.

No.	1	2	3	4
Capacity, inches	¼ to 1	1¼ to 2	2¼ to 3½	2¼ to 4
Price each	**21/3**	**29/9**	**41/6**	**54/6**
Extra cutters, doz.	**12/–**	**15/–**	**20/–**	**20/–**

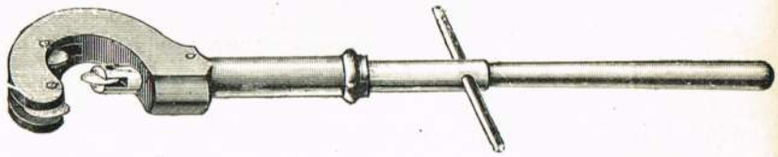

Fig. 874. **THREE-WHEEL TUBE CUTTER.**

Forged and best cast steel cutters.

No.	1	2	3	4
Capacity, inches	¼ to 1	1 to 2	2 to 3	2 to 4
Price each	**23/3**	**30/–**	**45/3**	**51/6**
Extra cutters, doz.	**12/–**	**15/–**	**20/–**	**20/–**

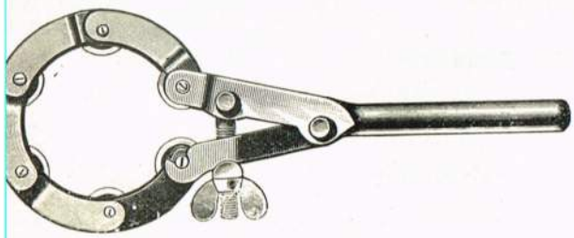

Fig. 875. CHAIN TUBE CUTTERS.

Specially suitable for confined spaces. For water, gas or steam pipes in wrought or cast iron. The size of cutter can be altered in a few minutes.

No.	1	2	3	4	5	6
Number of wheels	5	6	7	8	9	10
Capacity, inches	2 to 3	2 to 4	2 to 5	2 to 6	2 to 7	2 to 8
Price each	**53/9**	**60/6**	**67/–**	**73/3**	**79/6**	**86/–**

Spare links with wheel and pin, **6/6** each extra.

A complete set of three short chain links, fitted with wheels and pins to increase the cutting range down to ¾″, **19/9** each.

Fig. 876. Same pattern as above, but heavier, for larger pipes, and fitted with nut and spanner instead of wing nut.

No.	1	2	3	4	5	6
Number of wheels	5	6	7	8	9	10
Capacity, inches	5 to 6	5 to 7	5 to 8	5 to 10	5 to 11	5 to 13
Price each	**86/–**	**95/–**	**104/6**	**113/6**	**123/–**	**134/3**

Spare links, fitted with wheel and pin, **9/6** each extra.

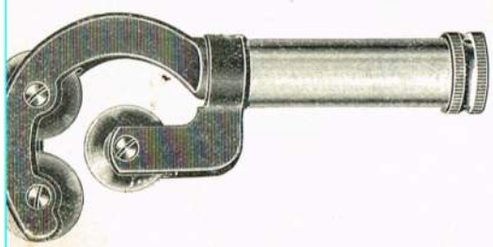

Fig. 877. THREE-WHEEL LEAD PIPE CABLE CUTTERS.

Capacity ½″ to 2½″ diameter. Larger sizes made to specification.
Price, **35/–** each. Spare wheels, **2/–** each extra.

All the Cutters listed above are fitted with hardened steel pins. The Cutters are manufactured from finest tool steel, hardened, tempered and polished. Spare parts can be supplied for any of the above designs.

Fig. 878.

PATENT RAPID ADJUSTABLE WRENCH.

Grips everything and never slips. Made of finest tool steel. All parts interchangeable. The wide range of opening from 1/16″ wire to 1½″ pipe is a distinct advantage, and permits of fine adjustment. Easy to manipulate with one hand. Length 10½″ when full open.
Price ... **5/6** each.

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PLIERS, SNIPS, &c.

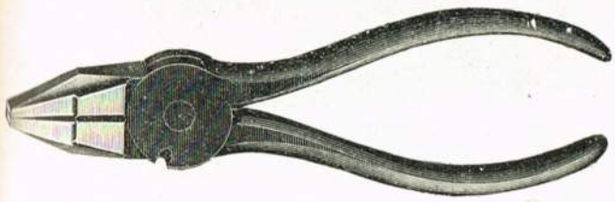

Fig. 900. Best Solid Steel Round Joint Cutting Pliers.

Prices per dozen.

Size, inches	5	5½	6	6½	7	8
Square Nose	**40/–**	**42/–**	**44/–**	**51/–**	**53/–**	**66/–**
Half-round nose	**44/–**	**46/–**	**48/6**	**56/–**	**58/–**	**71/–**
Square nose with burner hole	**45/–**	**47/–**	**49/–**	**56/–**	**59/–**	**72/–**
Half-round nose with burner hole	**48/–**	**50/–**	**52/6**	**60/–**	**62/–**	**75/–**

Fig. 901. Best Solid Steel Cutting Pliers. Square joint.

Size, inches	5	6	7	8
Square nose, per doz.	**40/–**	**44/–**	**53/–**	**66/–**
Half-round nose, per doz.	**44/–**	**48/–**	**57/–**	**70/–**
Square nose with burner hole, doz.	**44/–**	**48/6**	**57/6**	**71/–**
Half-round nose, with burner hole, per doz.	**48/–**	**52/–**	**61/–**	**74/–**

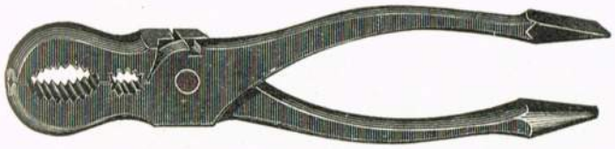

Fig. 902. Best Solid Steel Scotch Gas Pliers.

Size, inches	6	7	8	9	10
Price per dozen	**36/–**	**41/–**	**49/–**	**70/–**	**82/–**
Cheaper quality, per doz.	**18/–**	**22/–**	**26/–**	**39/–**	**48/–**

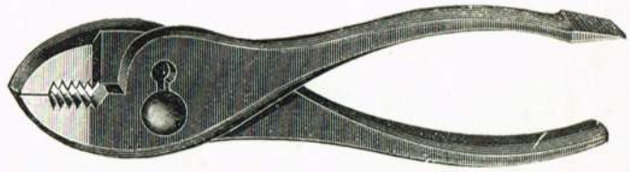

Fig. 903. Best Solid Steel Combination Pliers.

One size, 6½″. **40/–** per doz.
Cheaper quality. **22/–** per doz.

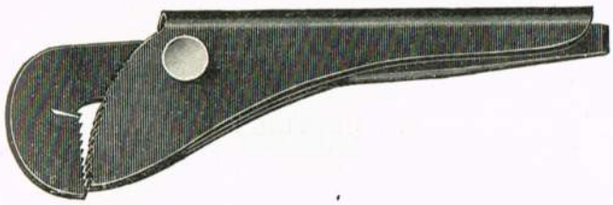

Fig. 904. Genuine Footprint Brand.

Size, inches	4	6	7	9
Price per dozen	**21/–**	**26/6**	**31/9**	**53/–**
Size, inches	12	14	17	21
Price per dozen	**85/6**	**103/9**	**184/6**	**255/6**

Fig. 904a. Cheaper quality.

Size, inches	4	6	7	9	12	14	17
Price per doz.	**18/–**	**19/–**	**24/–**	**34/–**	**60/–**	**92/–**	**144/–**

Fig. 905. Straight Pattern Tinmen's Snips.

Size	6	7	8	9	10	11
Price per doz.	**36/–**	**40/–**	**43/–**	**48/–**	**54/–**	**70/–**

Size	12	13	14	16	18
Price per doz.	**76/–**	**106/–**	**120/–**	**160/–**	**252/–**

Fig. 906. Bent Pattern Tinmen's Snips.

Size	6	7	8	9	10
Price per dozen	**43/–**	**64/–**	**70/–**	**72/–**	**81/–**

Size	11	12	13	14	16
Price per dozen	**100/–**	**114/–**	**154/–**	**180/–**	**240/–**

Fig. 907. Toggle Joint Cutting Pliers.

Size, inches	6¾	8
Price per doz.	**74/–**	**80/–**

Fig. 908. Toggle Joint Spoke Nippers.

Size, 8″ long.
Per doz. .... **67/–.**

Fig. 909.

Cone Pliers. **23/–** per doz.
Cone Pliers. Heavy. **27/–** doz.
Solid pattern, polished jaws, black handles. **12/–** per doz.

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WIRE CUTTERS.

ig. 910. MANCHESTER PATTERN CUTTING NIPPERS.

6	7	8	9	10	11	ins.
50/–	**58**/–	**66**/–	**76**/–	**86**/–	**98**/–	doz.
12	13	14	16	18		ins.
110/–	**124**/–	**144**/–	**180**/–	**228**/–		doz.

These nippers are made of best cast steel.

8″ will cut No. 8, 10″ No. 7, and 12″ No. 5 iron wire.

Fig. 911. CUTTING NIPPERS.

Tower Finish.

6	6½	7	7½	8	8½	9	ins.
17/6	**21**/–	**24**/–	**28**/–	**32**/–	**37**/–	**43**/–	doz.
9½	10	11	12	13	14	15	ins.
48/–	**53**/–	**61**/–	**70**/–	**80**/–	**90**/–	**102**/–	doz.

Common Finish.

6	6½	7	7½	8	8½	9	ins.
13/–	**14/6**	**16**/–	**17/6**	**19/6**	**22/6**	**25/6**	doz.
9½	10	11	12	13	14	15	ins.
29/–	**34**/–	**38/6**	**48**/–	**58**/–	**67**/–	**77**/–	doz.

ig. 912. HERCULES MACHINE-MADE STEEL NIPPERS.

Registered.

A Quality for Iron Wire.

		7	9	12 ins.
Tested to	....	8	6	4 W.G.
		48/–	**70/6**	**106**/– doz.

B Quality for Steel Wire.

		7	9	12 ins.
Tested to	....	12	10	8 W.G.
		58/–	**87**/–	**115**/– doz.

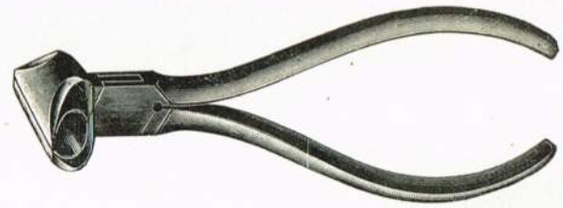

Fig. 913. CUTTING NIPPERS.

		5	5½	6	6½	7	ins.
Best Black	....	**20**/–	**23**/–	**26**/–	**30**/–	**34**/–	doz.
Lancashire Black	....	**32**/–	**37**/–	**45**/–	**53**/–	**61**/–	doz.
Lancashire Bright	....	**38/6**	**43**/–	**51**/–	**61**/–	**71**/–	doz.

ig. 914. LANCASHIRE SIDE-CUTTING NIPPERS.

	5	5½	6	6½	7	8	ins.
ck	**25/6**	**27/6**	**33/6**	**40**/–	**45**/–	**68**/–	doz.

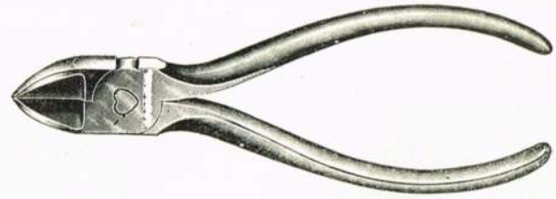

Fig. 915. BRIGHT STEEL SIDE CUTTING NIPPERS.

5″ .... **24**/– dozen.

NOTICE.—Owing to the ease with which a Cutting Nipper can be broken by being put to improper use we have been compelled to withdraw all Warranty on all Nippers.

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WIRE AND BOLT CUTTERS, Etc.

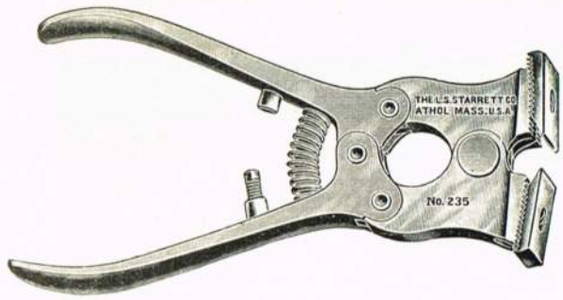

Fig. 916. Starrett No. 1 Adjustable Jaw Cut-Nippers.

The jaws of these nippers are detachable, so that they can be removed, reground and adjusted when they have become worn. Each jaw can be ground away to the extent of $\frac{1}{4}''$. A screw through the jaw engages with a spline in the frame and draws the jaw firmly down to the toothed seat, holding it securely. The adjustable screw and stud inside the handles permit setting the jaws so that the cutting edges will not be forced unnecessarily together. The construction of these cut-nippers furnish an abundant leverage.

Another improved feature in this cut-nipper is a flat spring below the cutting edges and over the joint, forming a yielding seat for the end of the wire to press against while being cut. This obviates the danger of breaking the jaws.

The head and handles are of drop forged steel, finely finished. All the parts are case-hardened, except the jaws. These are made from a high grade of steel, nicely tempered. Those warranted to cut music wire have their cutting edges ground to a short, steep bevel, while those for common use have their cutting edges ground more acute, work easier, and are preferable for cutting softer wire or for general use. The $5\frac{1}{2}''$ size is made with jaws held in place by one screw, whereas the $7''$ size is fitted with two screws.

PRICES.

$5\frac{1}{2}''$, M (for music wire)	**14/9**
$5\frac{1}{2}''$, C (for common use)	**14/9**
$5\frac{1}{2}''$, B (for bicycle use)	**14/9**
$7''$, either M, C or B	**18/9**
Extra jaws, either M, C, or B, which should be designated as above, per pair	**2/6**
Screws for jaws, per dozen	**1/3**
Splines for jaws, per dozen	**1/3**

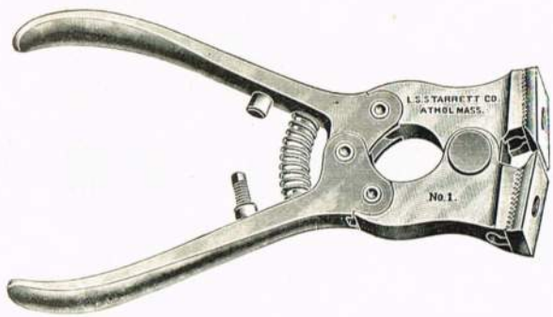

Fig. 918. Tile Cut-Nippers, No. 235.

These nippers are the same as No. 1 except that the frames are cut out to allow the jaws to be adjusted for wide opening as shewn in cut, thus fitting them to be used in cutting tile, for which purpose they are highly recommended by many tile workers who are now using them. The jaws can be easily replaced.

Prices: $5\frac{1}{2}''$, **14/9**; $7''$, **18/9**.

Fig. 920. The "New Easy" Bolt Clipper.

No.	0	1	2	3	4
Weight in lbs.	3	$5\frac{3}{4}$	9	13	$18\frac{1}{2}$
Length, inches	18	$24\frac{1}{2}$	30	36	42
To cut annealed bolts in thread, ins.	$^5/_{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Price	**16/–**	**21/–**	**29/6**	**37/6**	**50/–**

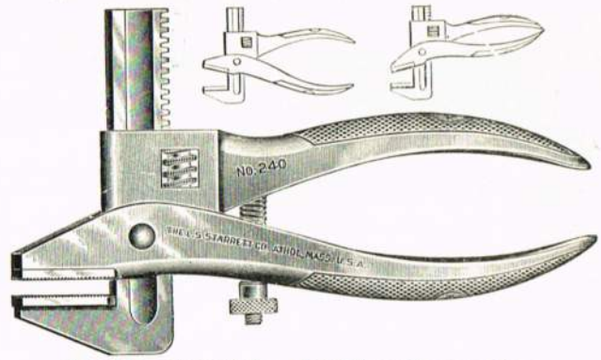

Fig. 917. Starrett No. 240 Adjustable Jaw Pliers.

The distinctive feature of these pliers is that one of the jaws may be adjusted to suit any piece, straight or tapering, from zero up to $1\frac{1}{4}''$. This adjustment is made by a small worm screw very similar to the one used on a small bicycle wrench. By having the jaws adjustable the handles may always be kept in just the proper position for grasping and exerting the greatest possible strength. No matter what the shape or relation of the faces of the work may be, these pliers can be so adjusted that the jaws will give a strong grip. For this reason the fulcrum may be made shorter than with the ordinary pliers, giving a greater leverage. The compression spring and screw, aside from performing its duty in keeping the jaws open at all times, aids one in maintaining a firm grip on the handles, thus preventing the jaws from slipping off the work.

These pliers will turn any nut, pipe or bolt within their limits, and will grip a headless nail, or wire. For working about an automobile or in fact on any machinery having small parts, this tool will be found one of the handiest in the whole kit. It is also useful about the home, and is of great convenience to electricians, plumbers and mechanics, motorists and cyclists.

Prices: Plain, **12/6**; Nickeled, **14/9**.

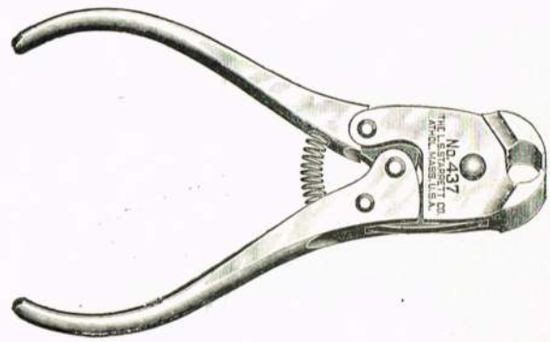

Fig. 919. Cut-Nipper No. 437. For Bicycle Spokes, etc.

This cut-nipper combines great power with rigidity. Wire can be cut at extreme end of jaws. Cutting jaws conform to inside of bicycle rim and will cut off spokes as close as required. In case a jaw breaks it may be replaced. Nippers open $^3/_{32}''$. Length of nippers overall $5\frac{1}{2}''$.

Prices: Cut-nippers, **13/9**; Jaws, per pair, **8/6**.

Fig. 921. Billings' Combination Drop-Forged Pliers.

Made from best tool steel. To cut wire up to $\frac{1}{8}''$ diam. Gas pliers. Turnscrew on handle.

Length inches	Pipe capacity	Black Price each	N.P. Price each	Bolts each	Nuts each
6	$\frac{1}{4}$—$\frac{3}{4}$	**4/8**	**5/3**	**4d.**	**3d.**
8	$\frac{1}{4}$—$\frac{3}{4}$	**5/7**	**6/3**	**4d.**	**3d.**
10	$\frac{1}{4}$—1	**6/3**	**7/4**	**5d.**	**3d.**

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DROP FORGED STEEL SPANNERS.

Fig. 930. Double-ended Spanner.

English sizes. Heads inclined 30°.

Size of Whitworth nuts	Minimum width in jaws finished	Length overall	Jaws milled and hardened Per doz.	Jaws milled, hardened and polished on flats of heads Per doz.
$\frac{1}{8}\times\frac{3}{16}$	·340 × ·450	$4\frac{1}{2}$	**3/6**	**4/6**
$\frac{3}{16}\times\frac{1}{4}$	·450 × ·527	$4\frac{5}{8}$	**4/–**	**5/–**
$\frac{1}{4}\times\frac{5}{16}$	·527 × ·602	$5\frac{1}{8}$	**4/6**	**5/6**
$\frac{1}{4}\times\frac{3}{8}$	·527 × ·712	$6\frac{1}{8}$	**5/–**	**6/6**
$\frac{5}{16}\times\frac{3}{8}$	·602 × ·712	$6\frac{3}{4}$	**6/–**	**7/6**
$\frac{5}{16}\times\frac{7}{16}$	·602 × ·822	7	**7/–**	**8/–**
$\frac{3}{8}\times\frac{7}{16}$	·712 × ·822	$7\frac{1}{2}$	**7/6**	**8/6**
$\frac{3}{8}\times\frac{1}{2}$	·712 × ·922	$8\frac{3}{8}$	**8/–**	**9/6**
$\frac{7}{16}\times\frac{1}{2}$	·822 × ·922	9	**8/6**	**10/–**
$\frac{7}{16}\times\frac{9}{16}$	·822 × 1·012	$9\frac{1}{4}$	**9/–**	**11/–**
$\frac{1}{2}\times\frac{9}{16}$	·922 × 1·012	$10\frac{1}{8}$	**10/–**	**12/6**
$\frac{1}{2}\times\frac{5}{8}$	·922 × 1·102	$10\frac{1}{8}$	**10/6**	**13/–**
$\frac{9}{16}\times\frac{5}{8}$	1·012 × 1·102	$10\frac{1}{8}$	**12/–**	**14/–**
$\frac{1}{2}\times\frac{3}{4}$	·922 × 1·302	$11\frac{1}{8}$	**14/–**	**16/–**
$\frac{5}{8}\times\frac{3}{4}$	1·102 × 1·302	$11\frac{1}{8}$	**14/–**	**16/–**
$\frac{3}{4}\times\frac{7}{8}$	1·302 × 1·482	$13\frac{3}{8}$	**18/–**	**22/–**
$\frac{3}{4}\times 1$	1·302 × 1·672	$14\frac{1}{2}$	**24/–**	**27/–**
$\frac{7}{8}\times 1$	1·482 × 1·672	$16\frac{1}{4}$	**27/6**	**32/–**
$1\times 1\frac{1}{8}$	1·672 × 1·864	18	**35/–**	**42/–**
$1\times 1\frac{1}{2}$	1·672 × 2·054	$18\frac{1}{2}$	**42/–**	**48/–**
$1\frac{1}{8}\times 1\frac{1}{4}$	1·864 × 2·054	$18\frac{1}{2}$	**42/–**	**48/–**
$1\frac{1}{4}\times 1\frac{3}{8}$	2·054 × 2·224	$22\frac{1}{2}$	**76/–**	**84/–**
$1\frac{1}{4}\times 1\frac{1}{2}$	2·054 × 2·414	$22\frac{1}{2}$	**76/–**	**84/–**
$1\frac{3}{8}\times 1\frac{1}{2}$	2·224 × 2·414	$22\frac{1}{2}$	**76/–**	**84/–**
$1\frac{1}{2}\times 1\frac{5}{8}$	2·414 × 2·584	$24\frac{3}{4}$	**105/–**	**124/–**
$1\frac{1}{2}\times 1\frac{3}{4}$	2·414 × 2·764	$24\frac{3}{4}$	**106/–**	**125/–**
$1\frac{5}{8}\times 1\frac{3}{4}$	2·584 × 2·764	$24\frac{3}{4}$	**107/–**	**126/–**
$1\frac{3}{4}\times 1\frac{7}{8}$	2·764 × 3·024	28	**140/–**	**160/–**
$1\frac{3}{4}\times 2$	2·764 × 3·154	28	**142/–**	**162/–**
$1\frac{7}{8}\times 2$	3·024 × 3·154	28	**144/–**	**164/–**

Fig. 931. Single-Ended Spanner.

English sizes. Heads inclined 30°.

Size of Whitworth nuts	Minimum width in jaws finished	Length overall	Jaws milled and hardened Per doz.	Jaws milled, hardened and polished on flats of heads Per doz.
$\frac{1}{8}$	·340	$4\frac{1}{2}$	**3/–**	**4/–**
$\frac{3}{16}$	·450	$4\frac{1}{2}$	**3/–**	**4/–**
$\frac{1}{4}$	·527	5	**3/–**	**4/–**
$\frac{5}{16}$	·602	$5\frac{7}{8}$	**3/6**	**4/6**
$\frac{3}{8}$	·712	$6\frac{3}{4}$	**4/6**	**5/–**
$\frac{7}{16}$	·822	$7\frac{3}{4}$	**5/6**	**6/–**
$\frac{1}{2}$	·922	$9\frac{1}{8}$	**6/–**	**7/–**
$\frac{9}{16}$	1·012	10	**8/–**	**9/–**
$\frac{5}{8}$	1·102	$10\frac{7}{8}$	**9/–**	**10/–**
$\frac{3}{4}$	1·302	$12\frac{3}{4}$	**12/6**	**14/–**
$\frac{7}{8}$	1·482	$14\frac{7}{8}$	**16/–**	**18/–**
1	1·672	$17\frac{1}{8}$	**26/–**	**28/–**
$1\frac{1}{8}$	1·864	19	**29/–**	**32/–**
$1\frac{1}{4}$	2·054	20	**35/–**	**38/–**
$1\frac{3}{8}$	2·224	23	**44/–**	**50/–**
$1\frac{1}{2}$	2·414	25	**67/–**	**73/–**
$1\frac{5}{8}$	2·584	27	**68/–**	**74/–**
$1\frac{3}{4}$	2·764	28	**81/–**	**88/–**
$1\frac{7}{8}$	3·024	30	**86/–**	**94/–**
2	3·154	31	**114/–**	**124/–**
$2\frac{1}{8}$	3·346	32	**124/–**	**136/–**
$2\frac{1}{4}$	3·556	35	**170/–**	**182/–**
$2\frac{3}{8}$	3·756	37	**180/–**	**198/–**
$2\frac{1}{2}$	3·896	39	**190/–**	**220/–**
$2\frac{3}{4}$	4·186	41	**300/–**	**340/–**
3	4·536	45	**320/–**	**400/–**

MILLIMETRE SIZES.

Fig. 932. Double-ended Spanner.

Heads inclined 30°.

Width of jaws finished	Length overall Inches	Black with jaws milled and hardened Per doz.	Jaws milled, hardened and polished on flats of heads Per doz.
6 × 8m/m	$4\frac{1}{2}$	**4/6**	**5/9**
10 × 12m/m	$4\frac{5}{8}$	**5/6**	**7/–**
2·5 × 14·5m/m	$5\frac{1}{8}$	**6/3**	**7/9**
14 × 16m/m	$6\frac{3}{4}$	**9/6**	**11/3**
18 × 20m/m	$7\frac{1}{2}$	**11/–**	**13/–**
20 × 22m/m	9	**13/–**	**15/3**
22 × 25m/m	$10\frac{1}{8}$	**16/9**	**19/–**
24 × 26m/m	$10\frac{1}{8}$	**16/9**	**19/–**
28 × 30m/m	$11\frac{1}{8}$	**22/–**	**24/9**
32 × 35m/m	$13\frac{3}{8}$	**30/6**	**33/9**
38 × 40m/m	$16\frac{1}{4}$	**45/–**	**50/–**
42 × 45m/m	18	**59/–**	**66/–**
50 × 55m/m	$22\frac{1}{2}$	**123/–**	**133/–**

Fig. 933. Single-ended Spanner.

Heads inclined 30°.

Width of jaws finished	Length overall Inches	Black with jaws milled and hardened Per doz.	Jaws milled, hardened and polished on flats of heads Per doz.
10m/m	$4\frac{1}{2}$	**4/6**	**5/3**
12m/m	$4\frac{1}{2}$	**4/6**	**5/3**
14m/m	5	**4/9**	**5/6**
16m/m	$5\frac{7}{8}$	**5/9**	**6/9**
18m/m	$6\frac{3}{4}$	**7/6**	**8/6**
20m/m	$7\frac{3}{4}$	**8/9**	**9/9**
22m/m	$9\frac{1}{8}$	**11/–**	**12/–**
25m/m	$10\frac{7}{8}$	**14/9**	**16/–**
28m/m	$10\frac{7}{8}$	**14/9**	**16/–**
30m/m	$12\frac{3}{4}$	**20/–**	**21/6**
32m/m	$12\frac{3}{4}$	**20/–**	**21/6**
35m/m	$14\frac{7}{8}$	**26/6**	**28/6**
38m/m	$14\frac{7}{8}$	**26/6**	**28/6**
40m/m	$17\frac{1}{8}$	**44/6**	**47/–**
42m/m	$17\frac{1}{8}$	**44/6**	**47/–**
45m/m	19	**50/–**	**54/–**
50m/m	20	**60/–**	**66/–**

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DROP FORGED STEEL SPANNERS.

Fig. 934. Solid Box Spanner with Fixed Tommy Bar.

Nut size, inches	½	⅝	¾	⅞	1	1⅛	1¼
Length overall, ins.	12	12	12	15	15	15	15
Black all over, holes broached and recessed per doz.	**28/–**	**33/–**	**42/–**	**63/–**	**78/–**	**95/–**	**124/–**

Fig. 935. Solid Box Spanner with Tommy Bar Head.

Nut Size, ins.	½	⅝	¾	⅞	1	1⅛	1¼
Length overall, ins.	12	12	12	15	15	15	15
Black all over, holes broached and recessed per doz.	**25/–**	**29/–**	**36/–**	**56/–**	**70/–**	**86/–**	**114/–**

Fig. 938. Crow's Foot Spanner.

Nut size .... ins.	¼	5/16	⅜	7/16	½	9/16	⅝
Milled and hardened per doz.	**36/–**	**40/–**	**48/–**	**51/–**	**64/–**	**72/–**	**78/–**
Nut size .... ins.	¾	⅞	1	1⅛	1¼	1⅜	1½
Milled and hardened per doz.	**92/–**	**116/–**	**138/–**	**162/–**	**186/–**	**222/–**	**258/–**

Fig. 940. Single-Ended Machine Tool Maker's Spanner.

Heads inclined 15°.

Nut size .... ins.	3/16	¼	5/16	⅜	7/16	½	⅝
Length ... ins.	3¾	3¾	4¾	5⅝	6½	7¼	9⅛
Jaws milled and hardened doz.	**3/–**	**3/–**	**3/6**	**4/–**	**5/–**	**6/–**	**9/–**
Nut sizes .... ins.	¾	⅞	1	1⅛	1¼	1⅜	1½
Length .... ins.	11¼	13	14¾	16¼	18½	20¾	22½
Jaws milled and hardened doz.	**13/–**	**19/–**	**28/–**	**32/–**	**40/–**	**48/–**	**67/–**

Fig. 936. Rat-Tail, Railroad, or Podger-ended Spanners.

Nut size .... ins.		⅜	½	⅝	¾
Minimum width in jaws .... ins.		·712	·922	1·102	1·302
Length overall .... ins.		13¾	15½	19¼	22½
Milled and hardened per doz.		**20/–**	**24/–**	**32/–**	**38/–**
Nut sizes .... ins.	⅞	1	1⅛	1¼
Minimum width in jaws .... ins.	1·482	1·672	1·864	2·054
Length overall .... ins.	26½	30	33½	37½
Milled and hardened per doz.	**48/–**	**55/–**	**70/–**	**88/–**

Fig. 937. Tap Keys.

Size of Square hole ins.	⅜	½	⅝	¾	⅞	1	1⅛	1¼
Length .... ins.	4½	5½	6½	7½	8½	10	11	11¾
Black finish, doz.	**5/–**	**8/–**	**9/3**	**11/–**	**14/6**	**19/–**	**23/–**	**30/–**

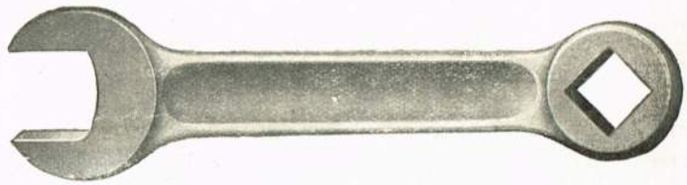

Fig. 939. Double-Headed Tool Post Wrench.

Open end nut size .... ins.	⅜	½	⅝
Closed end, square .... ins.	9/16	⅝	⅝
Length .... ins.	6½	7	7½
Polished heads .... per doz.	**12/6**	**14/3**	**15/9**

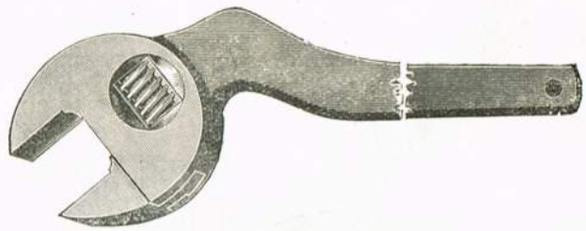

Fig. 941. CLYBURN SPANNER.

With best wrought iron jaw.

Length, inches ...	6	8	10	12	15
Span, inches ...	⅝	¾	1	1¼	1½
Price each ...	**6/–**	**7/–**	**8/6**	**10/6**	**12/9**
Length, inches		18	21	24	26
Span, inches		1¾	2	2¼	2½
Price each		**14/–**	**16/–**	**20/–**	**24/–**

Spanners of any Special Dimensions made to suit customers' requirements.

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SPANNERS.

Fig. 942. IMPROVED SELF-ADJUSTING PIPE WRENCH for Pipes and Sockets.

Capacity, inches	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{4}$	$\frac{1}{2}$ to $1\frac{1}{4}$	1 to 2	$1\frac{1}{4}$ to $2\frac{1}{4}$	$1\frac{1}{2}$ to 3	2 to 4
Price each	**8/3**	**9/–**	**12/–**	**18/–**	**23/–**	**30/–**	**47/–**

Fig. 943. IMPROVED PIPE WRENCH.

Capacity, inches ...	$\frac{1}{4}$ to $\frac{1}{2}$	$\frac{1}{2}$ to 1	1 to $1\frac{1}{2}$	$1\frac{1}{2}$ to 2	2 to 3
Price each... ...	**3/6**	**7/–**	**10/–**	**15/–**	**22/–**

Fig. 944.
"WILIAMS'" DROP FORGED STEEL RAILROAD SPANNER, Solid Handle.

Length, inches	6	8	10	12	15	18	21
Jaws open, inches	1	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{4}$	$2\frac{13}{16}$	3	$3\frac{15}{16}$
Price per dozen ...	**62/6**	**75/–**	**91/8**	**116/8**	**158/4**	**200/–**	**241/8**

Fig. 945.
WILLIAMS'" DROP FORGED STEEL RAILROAD SPANNER with Knife Handle.

Length, inches	6	8	10	12	15	18	21
Jaws open, inches	1	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{4}$	$2\frac{13}{16}$	3	$3\frac{15}{16}$
Price per dozen	**62/6**	**75/–**	**91/8**	**116/8**	**158/4**	**200/–**	**241/8**

Fig. 946.
"WILLIAMS'" DROP FORGED STEEL AGRICULTURAL WRENCH.

Length, inches ...	6	8	10	12	15
Jaws open, inches	$\frac{29}{32}$	$1\frac{5}{16}$	$1\frac{11}{16}$	$1\frac{7}{8}$	$2\frac{7}{16}$
Price per dozen ...	**41/8**	**50/–**	**58/4**	**75/–**	**100/–**

Fig. 947.

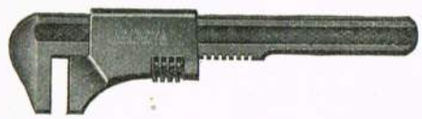

Fig. 948.

Fig. 949.

BILLINGS' ADJUSTABLE WRENCHES.

Model	Length ins.	Opens ins.	Weight ozs.	Price Black finish.
B	5	1	$7\frac{1}{2}$	**6/3**
D	6	$1\frac{1}{4}$	$11\frac{1}{4}$	**7/–**
E	7	$1\frac{3}{4}$	19	**8/6**

Model G.

Length, inches	6	8	10
Opens, inches	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{4}$
Price ...	**5/–**	**6/3**	**8/–**
Length, inches	12	14	18
Opens, inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Price ...	**10/–**	**12/6**	**15/9**

Model C.

Length	Opens	Weight	Price
5″	1″	7 ozs.	**6/3**

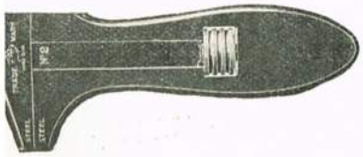

Fig. 950.
GENUINE KING DICK SPANNER.

Capacity, nuts inches	$\frac{5}{16}$	$\frac{7}{16}$	$\frac{3}{4}$	$1\frac{1}{4}$
Length, inches	3	4	6	8
Price each ...	**2/7**	**3/4**	**5/4**	**11/8**

Fig. 951.
K.D. PATTERN DROP-FORGED STEEL SPANNERS, Blued.

Length, inches	3	4	6
Price each	**1/6**	**2/3**	**3/6**

Fig. 952.
"FOOTPRINT" STAMPED STEEL THIN SPANNERS.

Length, inches	3	$4\frac{1}{4}$	$5\frac{1}{4}$
Price dozen ...	**46/6**	**49/6**	**58/-**

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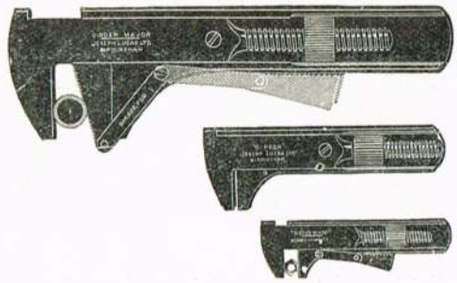
SPANNERS.



Spanner with pipe grip.

Spanner without pipe grip.

Fig. 953. Lucas Girder Wrench.

No.	Length	Jaws open	Finish	Price each
90	$3\frac{1}{4}''$	$\frac{5}{8}''$	Gun black	**3/6**
90G	$3\frac{1}{4}''$	$\frac{5}{8}''$, with pipe grip	,, ,,	**4/–**
91	$4\frac{1}{2}''$	$1\frac{1}{16}''$	,, ,,	**5/–**
91G	$4\frac{1}{2}''$	$1\frac{1}{16}''$, with pipe grip	,, ,,	**5/9**
93	$7\frac{1}{4}''$	$1\frac{7}{8}''$	,, ,,	**9/6**
93G	$7\frac{1}{4}''$	$1\frac{7}{8}''$, with pipe grip	,, ,,	**10/6**

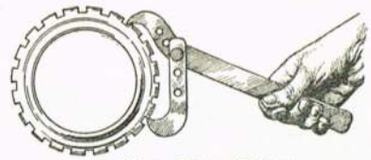


Fig. 954. Wrench.

Patent adjustable from 0 to $4\frac{1}{2}''$ C Wrench. The most useful and necessary wrench. One ought to be in every motor kit. Will not destroy the castellations on a packing plug. The harder the pull the better it grips. Price **4/9** each.

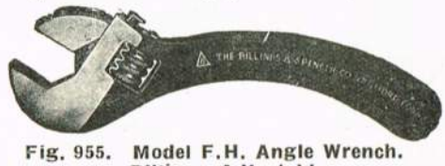


Fig. 955. Model F.H. Angle Wrench. Billings Adjustable.

Solid steel.

Size, inches	6	8	10
Capacity, inches	$\frac{13}{16}$	$1\frac{1}{16}$	$1\frac{1}{4}$
Weight	8 ozs.	13 ozs.	1 lb. 7 ozs.
Price each	**6/–**	**7/3**	**10/6**

Fig 956. Plug Spanner, specially made to fit both nuts on standard size plugs. Made from best tempered steel, it is strong and reliable. Blued **1/–**; Plated **1/6** each.

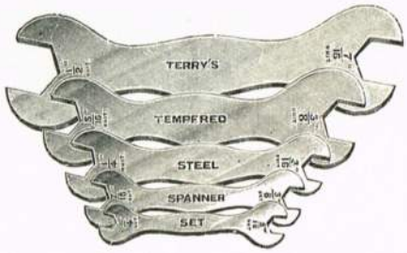


Fig. 957. Set of five high-grade accurately made tempered steel spanners. Are light, thin and durable, and they practically cover cyclists' and motorists' requirements. Give a choice of grips, from $\frac{1}{8}''$ to $\frac{1}{2}''$ Whitworth. Also $\frac{1}{4}''$ and $\frac{5}{16}''$ across flats. Blued **3/6**; Plated **6/–** per set.

Set of three—$\frac{3}{16}'' \times \frac{1}{4}''$, $\frac{5}{16}'' \times \frac{3}{8}''$, $\frac{7}{16}'' \times \frac{1}{2}''$, **2/9** per set.

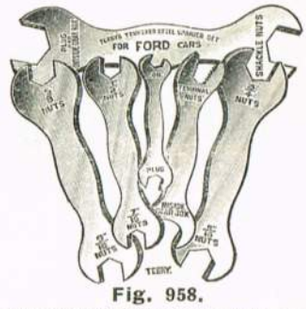


Fig. 958.

Terry's "Ford" Set fits every nut on a Ford car. Every grip has a value, is marked for its purpose, or with its size, and being tested to gauge, is accurate to measurement.

One spanner is specially designed for the terminal nuts on the batteries. Made in a good grade of thin steel, carefully hardened and tempered, the set may be relied upon for good service.

The set of six, Blued, **4/6**; Plated, **7/6.**

Fig. 959. The "Turbine" Spanner combines all the pleasing features of an adjustable spanner with the excellence of a rigid one. The frame is pressed steel, carefully tempered. Adjustment is made by moving thin steel blades, which are held in position by a spring. Gives a range of 12 grips.

Up to $\frac{5}{16}''$ Whitworth Blued **1/9**; Plated **2/6**
Up to $\frac{1}{2}''$,, ,, **3/–** ,, **4/–**

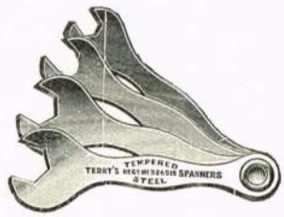


Fig. 960.

Four Folding Spanner Sets. Made from high-grade tempered steel, they are thin and strong, and fold into small compass for kit bag or pocket

No.		Blued	Plated
1	$\frac{5}{32}''$, $\frac{3}{16}''$, $\frac{7}{32}''$, $\frac{1}{4}''$ across flats	**9d.**	**1/3**
2	$\frac{1}{4}''$, $\frac{5}{16}''$, $\frac{3}{8}''$, $\frac{7}{16}''$,,	**1/6**	**2/6**
3	$\frac{1}{4}''$, $\frac{5}{16}''$, $\frac{3}{8}''$, $\frac{7}{16}''$ Whitworth	**2/6**	**5/–**

Fig. 961. The "Folding 5" Set. In high-grade hardened and tempered steel. For sizes of grip see No. 427, size 2. Includes cone and peg spanner. Blued **1/9**; Plated **3/–** set.

Fig. 962. Combination Spanner, fits all B.S.A. cycle nuts, including cones, with the addition of a screwdriver tip. Blued, **1/6** each, Plated **2/6** each.

Fig. 963. Magneto Spanner, very popular design. Thoroughly well made from best tempered steel, will give good service. Blued, **4½d.**; Plated, **7½d.** each.

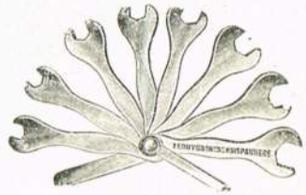


Fig. 964. The "Midget" Magneto Spanner Set. Fits all magnetos. Includes ·012 feeler gauge and small screw driver. Blued, **1/6**;

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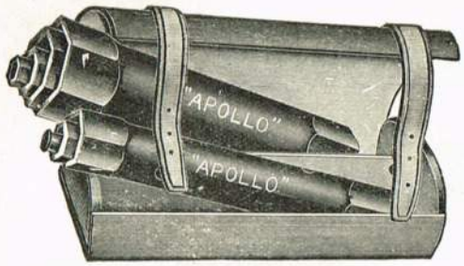
BOX SPANNERS.



g. 965. No. 10 Motor Car Set of Box Spanners, in cardboard box leather wallet. Each spanner is $7\frac{1}{2}''$ overall. Six pieces telescope :o two nests. These spanners are well made and will stand up the severe strain of motor car work.

:e of bolt, inches	$\frac{1}{8}\times{}^{3}/_{16}$	$\frac{1}{4}\times{}^{5}/_{16}$	$\frac{3}{8}\times{}^{7}/_{16}$
ross flats, inches	·338×·448	·525×·60	·709×·820
:e of bolt, inches	$\frac{1}{2}\times{}^{9}/_{16}$	$\frac{5}{8}\times\frac{3}{4}$	$\frac{7}{8}\times 1$
ross flats, inches	·920×1·01	1·1×1·3	1·48×1·67

t No. 10, in cardboard box	**9/–** each
,, in leather wallet	**16/–** ,,

Fig. 966. No. 24 Tubular Box Spanner of special sizes for Ford Cars, comprising four spanners, 6' long, and tommy bar, in cardboard box or leather wallet.

In the barrel, inches	$\frac{1}{2}\times 16$ gauge	$\frac{5}{8}\times 16$ gauge
Across flats, inches	${}^{5}/_{16}\times\frac{3}{4}$	${}^{7}/_{16}\times\frac{1}{2}$
In the barrel, inches	$\frac{3}{4}\times 14$ gauge	$\frac{7}{8}\times 14$ gauge
Across flats, inches	${}^{9}/_{16}\times\frac{5}{8}$	${}^{11}/_{16}\times\frac{3}{4}$

Set No. 24, in cardboard box	**3/6** each
,, in leather wallet	**6/6** ,

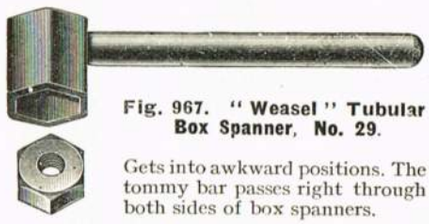


Fig. 967. "Weasel" Tubular Box Spanner, No. 29.

Gets into awkward positions. The tommy bar passes right through both sides of box spanners.

ıitworth nuts, inches	${}^{3}/_{16}$	$\frac{1}{4}$	${}^{5}/_{16}$	$\frac{3}{8}$	${}^{7}/_{16}$	$\frac{1}{2}$
. 29, Price per doz.	**4/–**	**5/–**	**6/–**	**6/6**	**8/6**	**9/–**
ıitworth nuts, inches	${}^{9}/_{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	
. 29, Price per doz.	**10/6**	**12/–**	**13/–**	**15/**	**16/6**	

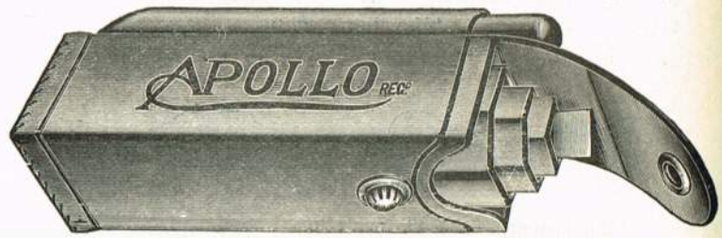


Fig. 969. Nos. 11, 12, 23, 39 and 40 Sets of Tubular Box Spanners, in cardboard box or leather wallet. Consists of three spanners to fit bolts $\frac{1}{8}''$, ${}^{3}/_{16}''$, $\frac{1}{4}''$, ${}^{5}/_{16}''$, $\frac{3}{8}''$, and a square nut ${}^{9}/_{32}''$ across flats. Nos. 11 and 12 do not include telescopic tommy-bar. No. 11 has screwdriver tommy-bar and No. 12 a plain tommy-bar.

Nos. 11 and 12 in cardboard box, **2/–**; in leather wallet **3/–** each
No. 23 ,, ,, **2/6**; ,, ,, **3/9** ,,

No. 39, comprising three spanners, $3\frac{1}{8}''$ long, and tommy-bar $4\frac{1}{4}''$ long, to fit nuts $\frac{1}{8}\times{}^{3}/_{16}$, $\frac{1}{4}\times{}^{5}/_{16}$, $\frac{3}{8}\times{}^{7}/_{16}$, in cardboard box, **2/-** each

No. 40. **Workshop Set**, comprising seven spanners, $7\frac{1}{2}''$ long, and two tommy-bars, to fit nuts $\frac{1}{8}''\times{}^{3}/_{16}''$, $\frac{1}{4}''\times{}^{5}/_{16}''$, $\frac{3}{8}''\times{}^{7}/_{16}''$, $\frac{1}{2}''\times{}^{9}/_{16}''$, $\frac{5}{8}''\times\frac{3}{4}''$, $\frac{7}{8}''\times 1''$, $1\frac{1}{8}''\times 1\frac{1}{4}''$. In cardboard box complete, **12/–** each set.

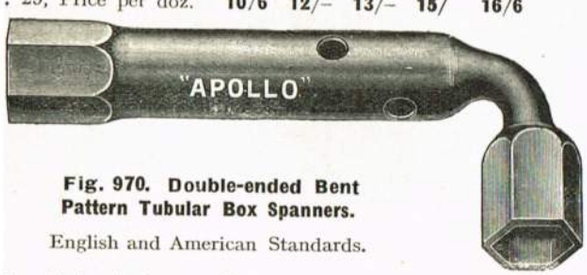


Fig. 970. Double-ended Bent Pattern Tubular Box Spanners.

English and American Standards.

iworth size, inches	${}^{3}/_{16}$	$\frac{1}{4}$	${}^{5}/_{16}$	$\frac{3}{8}$	${}^{7}/_{16}$	$\frac{1}{2}$
:e per dozen	**12/–**	**13/–**	**15/–**	**16/6**	**21/–**	**27/–**
itworth size, inches	${}^{9}/_{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	
:e per dozen	**30/–**	**33/–**	**42/–**	**45/–**	**48/–**	

Ford Sizes.

across flats, ins.	${}^{7}/_{16}$	$\frac{1}{2}$	${}^{9}/_{16}$	$\frac{5}{8}$	${}^{11}/_{16}$	$\frac{3}{4}$	$\frac{7}{8}$
:e per doz.	**12/–**	**13/–**	**14/–**	**15/–**	**16/–**	**16/6**	**24/–**

Fig. 968a. Sets of Whitworth Sizes and Millimetre Sizes of Tubular Box Spanners.

Fig. 968a. Whitworth Sizes, in Cardboard Boxes.

Extra Strong.

SET No. 14.	SET No. 15.	SET No. 16.
ur spanners, $7\frac{1}{2}''$	Four spanners, $7\frac{1}{2}''$	Four spanners, $7\frac{1}{2}''$
'erall, and one tommy.	overall, and one tommy.	overall, and one tommy.
<$\frac{7}{8}$ .... 1·67×1·48	$\frac{3}{4}\times\frac{5}{8}$ .... 1·3 ×1·1	${}^{9}/_{16}\times\frac{1}{2}$ .... 1·01×·920
<$\frac{5}{8}$ .... 1·3 ×1·1	${}^{9}/_{16}\times\frac{1}{2}$ .... 1·01×·920	${}^{7}/_{16}\times\frac{3}{8}$ .... ·820×·709
<$\frac{1}{2}$ .... 1·01×·920	${}^{7}/_{16}\times\frac{3}{8}$ .... ·820×·709	${}^{5}/_{16}\times\frac{1}{4}$ .... ·601×·525
<$\frac{3}{8}$ .... ·820×·709	${}^{5}/_{16}\times\frac{1}{4}$ .... ·601×·525	${}^{3}/_{16}\times\frac{1}{8}$ .... ·448×·338
Price, **7/6** set.	Price, **6/3** set.	Price, **5/–** set.

Fig. 968. French Sizes, in Cardboard Boxes.

Extra Strong.

SET No. 17.	SET No. 18.	SET No. 19.
Five spanners, $7\frac{1}{2}''$	Four spanners, $7\frac{1}{2}''$	Three spanners, $7\frac{1}{2}''$
overall, & one tommy.	overall, and one tommy.	overall, and one tommy.
20×18....$1\frac{1}{2}$ ×${}^{15}/_{16}$	17×16....${}^{17}/_{32}\times 1\frac{1}{8}$	15×14....${}^{11}/_{32}\times{}^{15}/_{16}$
17×16....${}^{17}/_{32}\times 1\frac{1}{8}$	15×14....${}^{11}/_{32}\times{}^{15}/_{16}$	12×10....${}^{27}/_{32}\times{}^{11}/_{16}$
15×14....${}^{11}/_{32}\times{}^{15}/_{16}$	12×10.... ${}^{27}/_{32}\times{}^{11}/_{16}$	8×7.... ${}^{9}/_{16}\times{}^{7}/_{16}$
12×10.... ${}^{27}/_{32}\times{}^{11}/_{16}$	8× 7.... ${}^{9}/_{16}\times{}^{7}/_{16}$	
8× 7.... ${}^{9}/_{16}\times{}^{7}/_{16}$		
Price, **8/–** set.	Price, **6/–** set.	Price, **4/2** set.

Fig. 971. PRICES OF INDIVIDUAL BOX SPANNERS.

Double-ended Spanners, $7\frac{1}{2}''$ long. Whitworth sizes.

s inches....	$\frac{1}{8}\times{}^{3}/_{16}$	${}^{3}/_{16}\times\frac{1}{4}$	$\frac{1}{4}\times{}^{5}/_{16}$	$\frac{1}{4}\times\frac{3}{8}$	${}^{5}/_{16}\times\frac{3}{8}$	$\frac{3}{8}\times{}^{7}/_{16}$	$\frac{3}{8}\times\frac{1}{2}$	${}^{7}/_{16}\times\frac{1}{2}$	$\frac{1}{2}\times{}^{9}/_{16}$	$\frac{1}{2}\times\frac{5}{8}$	$\frac{5}{8}\times\frac{3}{4}$	$\frac{3}{4}\times\frac{7}{8}$	$\frac{7}{8}\times 1$	$1\frac{1}{8}\times 1\frac{1}{4}$	$1\frac{3}{8}\times 1\frac{1}{2}$
:e per dozen	**8/–**	**8/6**	**11/–**	**12/–**	**12/–**	**13/6**	**16/6**	**16/6**	**20/–**	**20/–**	**22/–**	**24/–**	**26/–**	**40/6**	**45/–**

Fig. 971a. INDIVIDUAL SPANNERS. French sizes.

Size, m/m	8×7	12×10	15×14	17×16	20×18
Price per dozen	**9/–**	**13/6**	**20/–**	**22/–**	**24/–**

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BOX SPANNERS.

Fig. 972. Sets of 6 Best Tubular Box Spanners, for wireless work, in cardboard box. Absolutely indispensable.
Size, inches across flats, .240, .252, .286, .325, .337, .380. All 3″ long.
Price .... **15/–** per doz. sets.

Fig. 973. Extra Heavy Sets of Box Spanners, for workshop use. Whitworth sizes. With 2 tommy bars, in box.
Size, inches, $\frac{1}{4}\times\frac{5}{16}$, $\frac{3}{8}\times\frac{1}{2}$, $\frac{5}{8}\times\frac{3}{4}$, $\frac{7}{8}\times 1$, $1\frac{1}{8}\times 1\frac{1}{4}$.
Price per set, **6/–** complete.

Fig. 974. Heavy Hexagon Pattern Tubular Telescopic Box Spanners.
Whitworth sizes. With one tommy bar, in box.
Size, inches, $\frac{3}{16}$, $\frac{1}{4}\times\frac{5}{16}$, $\frac{3}{8}\times\frac{7}{16}$, $\frac{1}{2}\times\frac{5}{8}$.
Price per set, **10/8** complete.

Tubular Box Spanners made to any specification in the shortest time.

Fig. 976. Set No. 3.

Fig. 975. "APOLLO-FERRET" RATCHET BOX SPANNERS.

These are made up in the most useful sizes. In these spanners a small coil spring is fitted to each nut on the handle, to keep the teeth in mesh when in operation. This spring will not get out of gear. The handle is a drop forging having a double row of machine-cut gears. These are most necessary kits for motor works, general engineering shops, shipyards, etc.

SET No. 1.
English standard Whitworth nuts, in **leather** wallet, $7\frac{1}{4}''\times 3\frac{1}{4}''$.
Price .... **13/6**.

Bolt diam., inches	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	1
Over plate, inches	·448	·525	·600	·710	·820	·920

SET No. 1M.
Millimetre sizes, in **leather** wallet, $7\frac{1}{4}''\times 3\frac{1}{4}''$.
Price .... **14/6**.

Bolt diam., m/m	....	4	5	6	7	8
Over flats, inches	....	·273	·342	·410	·478	·546
Bolt diam., m/m	....	9	10	11	12	
Over flats, inches	....	·615	·683	·752	·820	

SET No. 2.
English standard Whitworth nuts, in **wood box**. Price **42/6.**

Bolt diam., inches	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	1
Over flats, inches	·920	1·010	1·100	1·200	1·300	1·390	1·480	1·670

SET No. 2M.
Millimetre sizes in **wood box.** Price **42/6.**

Bolt diam., m/m	13·00	14·00	15·00	16·00	17·00	18·00	20·00	20·00
Over flats, inches	·887	·957	1·025	1·093	1·219	1·230	1·367	1·492

SET No. 3 English comprises Sets Nos. 1 and 2 combined, in **wood box** complete, as illustrated. Price in wood box, **55/–**.
SET No. 3M French comprises Sets No. 1M and 2M combined in **wood box** complete, as illustrated. Price in wood box, **55/–**.
SET No. 4, for **Ford** cars. Eight spanners, $\frac{5}{16}''$, $\frac{3}{8}''$, $\frac{7}{16}''$, $\frac{1}{2}''$, $\frac{9}{16}''$, $\frac{5}{8}''$, $\frac{11}{16}''$ and $\frac{3}{4}''$ across flats, 1 extension piece and ratchet head, in **leather wallet**. Price **14/6**.
SET No. 5, Canadian Set. Seven spanners, $\frac{7}{16}''$, $\frac{1}{2}''$, $\frac{9}{16}''$, $\frac{5}{8}''$, $\frac{11}{16}''$, $\frac{3}{4}''$ and $\frac{7}{8}''$ across flats, 1 extension piece and ratchet head, in **leather wallet**. Price **14/6**.
SET No. 6, Canadian Workshop Set. Thirteen spanners, $\frac{15}{32}''$, $\frac{17}{32}''$, $\frac{19}{32}''$, $\frac{5}{8}''$, $\frac{21}{32}''$, $\frac{23}{32}''$, $\frac{25}{32}''$, $\frac{13}{16}''$, $\frac{27}{32}''$, $\frac{29}{32}''$, 1″, $1\frac{1}{32}''$, $1\frac{3}{32}''$ across flats, 1 extension piece $7\frac{1}{2}''$ long, and ratchet head. In **wood box**. Price **22/6.**

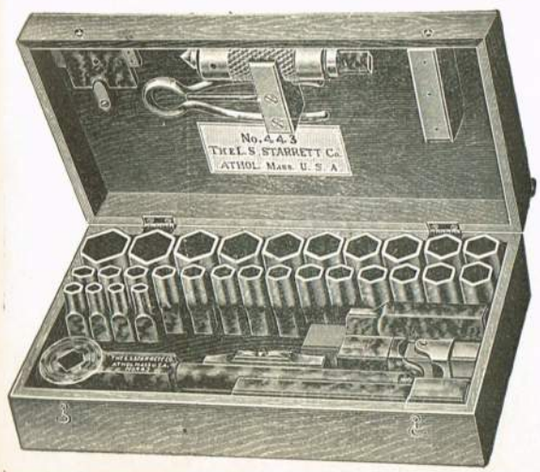

Fig. 977. (No 443).
STARRETT PATENT RATCHET WRENCH.

This wrench consists of a ratchet with reversible pawl and a long wrench handle. With this wrench an extension is furnished to reach into otherwise inaccessible places ; also a universal joint for turning nuts or bolts when it is impossible to get the wrench on at right-angles to the ends of the bolt : a spark plug socket for use on automobile and aeroplane engines ; a drilling attachment which takes standard square shank drills from $\frac{1}{8}''$ to $\frac{1}{2}''$ diameter, and a screwdriver with reversible end ; together with several adjustments to go with the drilling attachment.

This ratchet wrench is of particular value to engineers and chauffeurs who have to work about machinery crowded into small space or around hot engines. The sockets for the wrench will turn nearly any standard hexagon nut or bolt. With this wrench finished surfaces and corners of nuts need not be marred by taking it off and replacing at every fraction of a turn.

Price complete as illustrated **62/6**
,, without drill fixture **50/–**

Spare parts supplied.

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SPANNERS.

ig. 978. B.S.A. DROP-FORGED STEEL SINGLE-ENDED SPANNERS.

o.	20	21	22	23	24	25
ze of bolt, inches	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$
rice per dozen ...	**9/6**	**11/–**	**12/6**	**14/3**	**16/9**	**18/3**
o.	26	27	28	29	30	31
ze of bolt, inches	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
rice per dozen ...	**20/–**	**24/6**	**29/6**	**40/6**	**56/–**	**70/6**

Fig. 980. B.S.A. SET.

omprising spanners $\frac{3}{16}'' \times \frac{1}{4}''$, $\frac{5}{16}'' \times \frac{3}{8}''$, $\frac{7}{16}'' \times \frac{1}{2}''$, $\frac{9}{16}'' \times \frac{5}{8}''$ and $\frac{3}{4}''$.
Price ... **12/6** per set.

Fig. 979. B.S.A. DROP-FORGED STEEL DOUBLE-ENDED SPANNERS.

No.		1	2	3	4	5
Size, inches ...		$\frac{1}{8} \times \frac{3}{16}$	$\frac{1}{8} \times \frac{1}{4}$	$\frac{3}{16} \times \frac{1}{4}$	$\frac{1}{4} \times \frac{5}{16}$	$\frac{1}{4} \times \frac{3}{8}$
Price per dozen ...		**12/6**	**13/–**	**14/–**	**17/–**	**20/–**
No. ...	6	7	8	9	10	11
Size, inches	$\frac{5}{16} \times \frac{3}{8}$	$\frac{3}{8} \times \frac{7}{16}$	$\frac{3}{8} \times \frac{1}{2}$	$\frac{7}{16} \times \frac{1}{2}$	$\frac{1}{2} \times \frac{9}{16}$	$\frac{1}{2} \times \frac{5}{8}$
Price per doz.	**21/–**	**22/6**	**24/–**	**26/–**	**29/–**	**34/6**
No. ...	12	13	14	15	16	17
Size, inches	$\frac{9}{16} \times \frac{5}{8}$	$\frac{5}{8} \times \frac{3}{4}$	$\frac{5}{8} \times \frac{7}{8}$	$\frac{3}{4} \times \frac{7}{8}$	$\frac{3}{4} \times 1$	$\frac{7}{8} \times 1$
Price per doz.	**37/6**	**40/6**	**52/6**	**67/6**	**82/–**	**97/6**

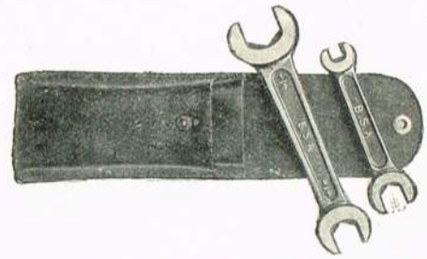

Fig. 981. B.S.A. SET IN WALLET.

Sizes: Large spanner, $\frac{5}{16}''$, $\frac{3}{8}''$, $\frac{7}{16}''$, and $\frac{1}{2}''$.
Small spanner, .44″, .525″, .594″ hex. and 26″. square.
Price ... **6/-** per set.

Fig. 982. WILLIAMS' DROP-FORGED ADJUSTABLE "S" WRENCH.

Handy wrench for cramped positions.

ze, length, ins.	6	8	10	12	14
ws open, ins.	$\frac{3}{4}$	1	$1\frac{3}{8}$	$1\frac{5}{8}$	2
ice per doz.	**33/4**	**41/8**	**50/–**	**75/–**	**100/–**

Fig. 983.
UNIVERSAL PATENT AUTOMATIC ADJUSTABLE RATCHET SPANNER.

Made throughout from solid steel. Jaws remain parallel, and the greater the leverage the tighter the grip.

Size		Jaws open Bolt sizes inches		Price each
1	...	$\frac{1}{8}$ to $\frac{5}{8}$	...	**5/–**
2	...	$\frac{1}{4}$ to $1\frac{1}{8}$	...	**6/6**

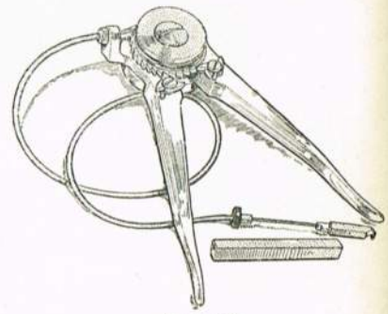

Fig. 984.
"KING DICK" COTTER PIN EXTRACTOR.

A really efficient means of extracting split cotter-pins easily from castellated nuts. Insert the point A in the loop of the pin and work the pliers. Price ... **25/-** each.

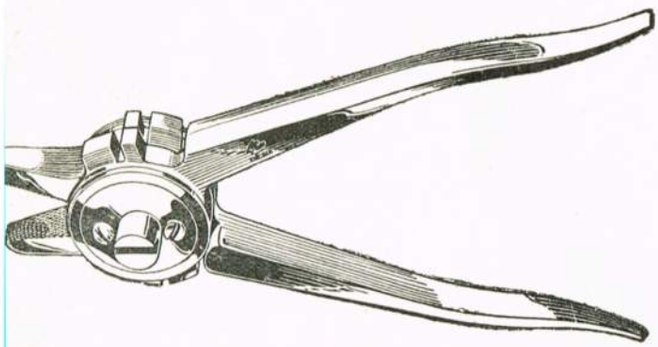

Fig. 985. "KING DICK" HOSE COUPLING PLIERS.

Invaluable for all connections on compressed air services. Hose pipes for water, tyre pumps, radiators, etc.
Price ... **21/-** each.

Take a piece of ordinary iron or galvanised wire approximately . 16 standard wire gauge (scrap wire may be used), and cut off ength of about 15″ by means of the wire cutter. Fifteen inches a suitable length for hose up to $1\frac{1}{4}''$ diameter—for larger hose length should be increased proportionately. Grip the wire at centre between the jaws of the pliers and wind each end around boss on either side of the pliers. The two rings so formed must taken off the bosses by bending them upwards; the wire loop hen ready for slipping on to the hose, previous to tightening.

With the loop in the desired position, draw tight as much of slack wire as possible by pulling alternately each loose end with the pliers. Pass the two ends of the wire loop into the slots in the trunions on either side of the pliers and butt the long jaw of the pliers against the end of the loop upon the hose line. Then, by opening and closing the jaws of the pliers, the trunions are made to revolve, this action at the same time drawing the wire tight around the boss.

When sufficiently tight, by bending the pliers back against the hose, the wire is held and will not loosen. The wires are now slipped off the trunions and the surplus ends are cut off, the short projecting ends being knocked down so as to lie flat on the hose,

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SPANNERS.

Fig. 986.

"KING DICK" SPANNERS in Leather Wallets.

Size.	Description.	Price each.
121	Will hold 3″, 4″, 6″ and 9″ sizes...	**14/6**
122	,, 3″, 4″ and 6″ sizes ...	**3/11**
123	,, 3″ sizes only	**1/-**

Fig. 987. No. 1432T.

THE "KING DICK" MOTOR CYCLE TOOL KIT.

Comprising a high-grade canvas roll with adjustable strap and pocket complete, with "King Dick" spanners sizes 3″ and 6″, small combination spanner, valve cap spanner, pliers, cone spanner, file, valve grinder, claw spanner, turnscrew. Price **18/6** each.

Fig. 988.

No. 182 **SIX-WAY NIPPLE KEYS.**

Made from high-grade steel. Machined and hardened.

Size	1	2	3	4	5	6
Diam. nipples across	.130	.145	.159	.186	.205	.242

Price .... **13/6** per doz.

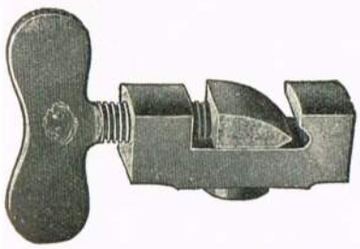

Fig. 989.

No. 156 **SPOKE GRIP.**

Hardened and tempered.

Price .... **33/6** per dozen.

Fig. 990.

No. 155 **FOUR-WAY NIPPLE**

Key for 10 to 15 gauge nipple.

Price .... **11/-** per doz.

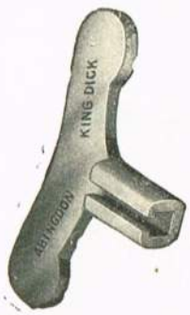

Fig. 991

No. 154 **SINGLE-WAY** for 15-gauge nipples.

Price .... **5/6** per doz.

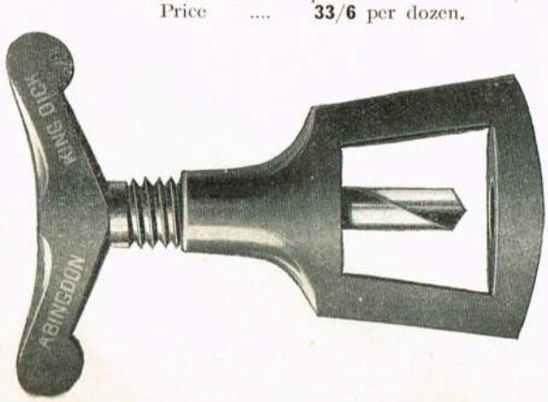

Fig. 992.

"KING DICK" BELT PUNCH.

Manufactured from steel forgings, accurately machined and well finished in the same high standard as all "K. D." specialities. Will pierce clean holes through the toughest of belts without clogging.

Size		Price per doz.
145P.	For ¾″ belts	**33/6**
146P.	For ⅞″ belts	**33/6**
147P.	For 1″ belts	**33/6**
148P.	For 1⅛″ belts	**33/6**

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FILES.

Fig. 1000

Flat, Square, Round, Entering, Taper Cotter Files, Mill Saw Files, Two Square Edges, Single-Cut.

Length. Ins.	Rough and Bastard. Per doz. £ s. d.	2nd Cut. Per doz. £ s. d.	Smooth. Per doz. £ s. d.	Dead Smooth. Per doz. £ s. d.
1 to 4	0 7 0	0 8 3	0 9 6	0 14 6
4½	0 7 6	0 9 0	0 10 3	0 16 0
5	0 8 0	0 9 9	0 11 0	0 17 6
5½	0 8 6	0 10 6	0 11 9	0 19 0
6	0 9 0	0 11 3	0 12 6	1 0 6
6½	0 9 6	0 12 0	0 13 3	1 2 0
7	0 10 0	0 12 9	0 14 0	1 3 6
7½	0 11 0	0 13 9	0 15 3	1 5 0
8	0 12 0	0 14 9	0 16 6	1 6 6
8½	0 13 0	0 15 9	0 17 9	1 8 0
9	0 14 0	0 16 9	0 19 0	1 9 6
9½	0 15 0	0 17 9	1 0 3	1 11 0
10	0 16 0	0 19 0	1 1 6	1 12 6
10½	0 17 0	1 0 3	1 2 9	1 14 0
11	0 18 6	1 1 6	1 4 0	1 15 0
11½	1 0 0	1 2 9	1 5 3	1 18 0
12	1 1 6	1 4 0	1 6 6	2 0 0
12½	1 3 0	1 5 6	1 8 0	2 2 0
13	1 5 0	1 7 0	1 10 0	2 5 0
14	1 10 0	1 13 0	1 16 0	2 14 0
15	1 16 0	1 19 0	2 2 0	3 3 0
16	2 3 0	2 7 0	2 12 0	3 18 0
17	2 10 0	2 15 0	3 3 0	4 14 0
18	3 0 0	3 5 0	3 14 0	5 11 0
19	3 8 0	3 15 0	4 4 0	6 6 0
20	4 1 0	4 9 0	4 19 0	7 9 0
21	4 13 0	5 1 0	5 13 0	8 10 0
22	5 6 0	5 15 0	6 8 0	9 12 0
23	6 1 0	6 12 0	7 6 0	11 0 0
24	7 0 0	7 11 0	8 6 0	12 10 0

Extras.

Mill Saw, double cut, advance one inch.

Mill Saw, one round edge, advance half inch.

Mill Saw, two round edges, advance one inch.

Flat, one round edge, advance half inch.

Flat, two round edges, advance one inch.

Hand, Half-Round, Three-Square, Equalling One Safe Edge, Parallel Cotter, Slotting, Pillar, Warding or Extra Thin Flat, Needle, Round-Off, Bone, Pottance, Coffin Files, Topping Files, Two Square Edges, Single Cut.

Length. Ins.	Rough and Bastard. Per doz. £ s. d.	2nd Cut. Per doz. £ s. d.	Smooth. Per doz. £ s. d.	Dead Smooth. Per doz. £ s. d.
1 to 4	0 8 6	0 9 9	0 11 6	0 17 6
4½	0 9 6	0 10 9	0 12 6	0 18 9
5	0 10 6	0 11 9	0 13 6	1 0 3
5½	0 11 6	0 12 9	0 14 6	1 1 9
6	0 12 6	0 13 9	0 15 6	1 3 3
6½	0 13 6	0 15 0	0 16 6	1 5 0
7	0 14 6	0 16 3	0 17 9	1 6 9
7½	0 15 6	0 17 6	0 19 0	1 8 6
8	0 16 6	0 18 9	1 0 3	1 10 6
8½	0 17 6	1 0 0	1 1 6	1 12 3
9	0 18 6	1 1 3	1 2 9	1 14 3
9½	0 19 6	1 2 6	1 4 0	1 16 0
10	1 0 6	1 3 9	1 5 6	1 18 6
10½	1 1 6	1 5 0	1 7 0	2 0 6
11	1 3 0	1 6 3	1 8 6	2 2 9
11½	1 4 6	1 7 6	1 10 0	2 5 0
12	1 6 0	1 8 9	1 11 6	2 7 6
12½	1 8 0	1 10 0	1 13 0	2 10 0
13	1 10 0	1 13 0	1 16 0	2 14 0
14	1 16 0	1 19 0	2 2 0	3 3 0
15	2 3 0	2 7 0	2 12 0	3 18 0
16	2 10 0	2 15 0	3 3 0	4 14 0
17	3 0 0	3 5 0	3 14 0	5 11 0
18	3 8 0	3 15 0	4 4 0	6 6 0
19	4 1 0	4 9 0	4 19 0	7 9 0
20	4 13 0	5 1 0	5 13 0	8 10 0
21	5 6 0	5 15 0	6 8 0	9 12 0
22	6 1 0	6 12 0	7 6 0	11 0 0
23	7 0 0	7 11 0	8 6 0	12 10 0
24	7 19 0	8 12 0	9 8 0	14 2 0

Extras.

Flat-back and High-back, Half-round, advance half-inch.
Bellied Three-square, advance one inch.
Equalling and Cotter, extra thin, advance one inch.
Cotter, Slotting and Pillar, one round edge, advance half inch; two round edges, advance one inch.
Needle exceeding breadth of Hand, advance half inch.
Round-off with points, advance one inch.
Topping, cut to point, advance half inch.
,, double cut, advance one inch.
,, one round edge, advance half inch.
,, two round edges, advance one inch.

Hand and Equalling Cut both Edges or with One Double-Cut Edge, Lock, Arch, Riffler, Tumbler, Oval Saw, Pin and Cant Files.

Length. Ins.	Rough and Bastard Per doz. £ s. d.	2nd Cut. Per doz. £ s. d.	Smooth. Per doz. £ s. d.	Dead Smooth. Per doz. £ s. d.
1 to 4	0 9 6	0 10 9	0 12 6	0 18 9
4½	0 10 6	0 11 9	0 13 6	1 0 3
5	0 11 6	0 12 9	0 14 6	1 1 9
5½	0 12 6	0 13 9	0 15 6	1 3 3
6	0 13 6	0 15 0	0 16 6	1 5 0
6½	0 14 6	0 16 3	0 17 9	1 6 9
7	0 15 6	0 17 6	0 19 0	1 8 6
7½	0 16 6	0 18 9	1 0 3	1 10 6
8	0 17 6	1 0 0	1 1 6	1 12 3
8½	0 18 6	1 1 3	1 2 9	1 14 3
9	0 19 6	1 2 6	1 4 0	1 16 0
9½	1 0 6	1 3 9	1 5 6	1 18 6
10	1 1 6	1 5 0	1 7 0	2 0 6
10½	1 3 0	1 6 3	1 8 6	2 2 9
11	1 4 6	1 7 6	1 10 0	2 5 0
11½	1 6 0	1 8 9	1 11 6	2 7 6
12	1 8 0	1 10 0	1 13 0	2 10 0
12½	1 10 0	1 13 0	1 16 0	2 14 0
13	1 13 0	1 16 0	1 19 0	2 19 0
14	1 19 0	2 3 0	2 8 0	3 10 0
15	2 6 0	2 11 0	2 18 0	4 6 0
16	2 15 0	3 0 0	3 7 0	5 2 0
17	3 4 0	3 10 0	3 19 0	5 18 0
18	3 14 0	4 2 0	4 11 0	6 18 0
19	4 7 0	4 15 0	5 6 0	8 0 0
20	5 0 0	5 8 0	6 0 0	9 0 0
21	5 14 0	6 3 0	6 16 0	10 6 0
22	6 11 0	7 1 0	7 16 0	11 16 0
23	7 10 0	8 1 0	9 2 0	13 14 0
24	8 8 0	9 2 0	10 8 0	15 12 0

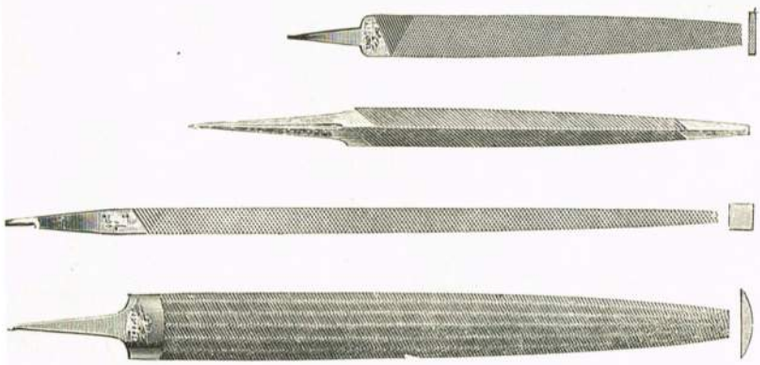
Extras.

Hand and Equalling, one round edge, advance half-inch, two round edges, advance one inch.

Equalling, cut both edges, extra thin, advance one inch.

Feather Edge and Knife, advance two inches.

Taper Crossing, advance two inches.



Taper Saw Files, If Cut to Point, advance one inch. Cross Cut Saw Files.

ngth.	2nd Cut Single Per doz. £ s. d.	2nd Cut Double Per doz. £ s. d.	Sm'th. S'gle Double Cut, Adv. ½-in. Per doz. £ s. d.	Blunt, Cant, and Segment Saw Files 2nd Cut Single Per doz. £ s. d.	Blunt 2nd Cut Double and Taper Band Saw Files 2nd Cut Single Per doz. £ s. d.	Pit or Frame Saw Files and Gulleting. (Frame Equalling Advance 3 in.). (Taper Frame Saw Files, advance 1 in.) 2nd Cut Single Per doz. £ s. d.	2nd Cut Double Per doz. £ s. d.
o 3½	0 7 0	0 8 0	0 8 3	0 8 6	0 10 6	0 7 6	0 8 6
	0 7 3	0 8 3	0 8 9	0 9 6	0 12 0	0 8 6	0 9 6
1½	0 7 6	0 8 9	0 9 9	0 10 6	0 13 6	0 9 6	0 10 6
5	0 8 3	0 9 9	0 11 0	0 12 0	0 15 6	0 10 6	0 12 0
2½	0 9 3	0 11 0	0 12 6	0 13 6	0 17 6	0 12 0	0 13 0
	0 10 9	0 12 6	0 13 9	0 15 6	0 19 6	0 13 6	0 14 6
3½	0 12 0	0 13 9	0 15 0	0 17 6	1 1 6	0 14 6	0 16 0
	0 13 6	0 15 0	0 16 6	0 19 6	1 4 0	0 16 0	0 17 6
7½	0 15 0	0 16 6	0 18 0	1 1 6	1 6 6	0 18 0	0 19 6
	0 17 0	0 18 0	1 0 0	1 4 0	1 9 0	1 0 0	1 2 0
4½	0 19 0	1 0 0	1 2 6	1 6 0	1 11 0	1 2 6	1 4 0
	1 1 6	1 2 6	1 6 0	1 9 0	1 14 0	1 5 0	1 7 0
	1 4 0	1 6 0	1 11 0	1 15 0	2 0 0	1 11 0	1 13 0
	1 9 0	1 11 0	1 17 0	1 19 0	2 4 0	1 15 0	1 17 0
	1 14 0	1 17 0	2 3 0	2 5 0	2 10 0	2 1 0	2 3 0
	2 0 0	2 3 0	2 10 0	2 10 0	2 15 0	2 6 0	2 8 0
	2 6 0	2 10 0	3 0 0	2 15 0	3 0 0	2 10 0	2 13 0
Double-Ended Taper Saw Files			7 **10/6**	8 **12/–**	9 **13/6**	10 **15/6**	11 **17/6** 12 inches **19/6**

RASPS.

Flat, Half-Round, and Round Rasps.

Length	Horse Rasps	Length	Rough and Bastard; also Plain Shoe Rasps	2nd Cut.	Smooth; also Cabine Files and Rasps
Ins.	Per doz. £ s. d.	Ins.	Per doz. £ s. d.	Per doz. £ s. d.	Per doz. £ s. d.
4		4	0 8 6	0 9 9	0 11 6
4½		4½	0 9 6	0 10 9	0 12 6
5		5	0 10 6	0 11 9	0 13 6
5½		5½	0 11 6	0 12 9	0 14 6
6		6	0 12 6	0 13 9	0 15 6
6½		6½	0 13 6	0 15 0	0 16 6
7		7	0 14 6	0 16 3	0 17 9
7½		7½	0 15 6	0 17 6	0 19 0
8		8	0 16 6	0 18 9	1 0 3
8½		8½	0 17 6	1 0 0	1 1 6
9		9	0 18 6	1 1 3	1 2 9
9½		9½	0 19 6	1 2 6	1 4 0
10	0 18 0	10	1 0 6	1 3 9	1 5 6
10½		10½	1 1 6	1 5 0	1 7 0
11	1 1 6	11	1 3 0	1 6 3	1 8 6
11½		11½	1 4 6	1 7 6	1 10 0
12	1 5 0	12	1 6 0	1 8 9	1 11 6
12½		12½	1 8 0	1 10 0	1 13 0
13	1 10 0	13	1 10 0	1 13 0	1 16 0
14	1 16 0	14	1 16 0	1 19 0	2 2 0
15	2 3 0	15	2 3 0	2 7 0	2 12 0
16	2 10 0	16	2 10 0	2 15 0	3 3 0
17	3 0 0	17	3 0 0	3 5 0	3 14 0
18	3 8 0	18	3 8 0	3 15 0	4 4 0

Extras.

Single Swaged advance half-inch.

Double Swages advance one inch.

Tanged Horse Rasps advance two inches.

Extras.

Hand Rasps, advance one inch on Flat Rasps.
Single Improved Shoe Rasps, advance half-inch—Double Improved, advance one inch—on Plain Shoe Rasps.
Extra Smooth Cabinets, advance one inch on Cabinets.
Flat and Half-Round Gunstockers' Rasps and Lastmakers' Rasps, advance two inches on Cabinets.
Saddle Tree Rasps, advance three inches on Cabinets.

Horse Mouth Rasps .... **7/6** each.
Bread Rasps, Handled .... **50/–** per doz.

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DREADNOUGHT FILES.

Hand Shape, One Safe Edge.

Flat Shape, Teeth on both Edges.

Fig. 1005. Tanged Pattern.

Hand, Flat, Round, Half Round, Three-Square and Flat Millsaw (Smooth Cut only).

Length, inches	4	6	8	10	12	14	16	18	20
Bastard, per dozen	**12**/–	**15**/–	**20**/–	**26**/–	**32**/–	**45**/–	**63**/–	**78**/–	**95**/–
Second Cut, per dozen	**13**/–	**16**/–	**22**/–	**28**/–	**34**/–	**48**/–	**67**/–	**82**/–	**99**/–
Smooth Cut, per dozen	**14**/–	**17**/–	**24**/–	**30**/–	**36**/–	**51**/–	**71**/–	**86**/–	**103**/–
Extra Smooth Cut, per dozen	**16**/–	**19**/–	**27**/–	**33**/–	**40**/–	—	—	—	—

A Dreadnought Speciality is a combined Cut File, with Bastard Cut on one side and Smooth Cut on the reverse, in Hand Shape only, at prices same as for Second Cut List.

Fig. 1006. Original or Blade Type Dreadnought Files.

In Flat, Parallel and Half-round.

Length, inches	8	10	12	14	16	18
Bastard Cut, per dozen	**17**/–	**22**/–	**26**/–	**34**/–	**45**/–	**63**/–
Second Cut, per dozen	**19**/–	**24**/–	**28**/–	**36**/–	**48**/–	**67**/–
Smooth Cut, per dozen	**21**/–	**26**/–	**32**/–	**40**/–	**54**/–	**71**/–
Extra Back Supports, each	**1**/–	**1/3**	**1/6**	**1/9**	**2**/–	**2/3**

The above Blade Files are used with a back support which is flat on one side and half-round on the other, so that the same back can be used with flat blades and half-round blades. These can be instantly detached. One back support is supplied free with complete dozen File Blades.

Fig. 1007. HORSESHOE RASPS.

Size. Inches	12	14	16	18
No. 20. Double ended pattern, per dozen	**32**/–	**45**/–	**63**/–	**78**/–
No. 10. Tanged Pattern, per dozen	**45**/–	**63**/–	**78**/–	**110**/–

Fig. 1008 SURFACE TOOLS.

These Tools will be found extremely useful where large surfaces require to be filed and upon which a file cannot be used. They possess all the advantages of the regular "Dreadnought" Files in cutting speed, durability and self clearing properties.

Made in two shapes. Pattern No. 200 is composed of a loose blade mounted on a wood holder, with iron handle. Patterns No. 205 and 210 are designed to withstand heavy and rough usage, and are composed of a loose blade mounted on a solid iron holder. Made in various sizes and three different cuts.

	No. 200						Nos. 205 & 210		
Size. Inches	8	10	12	14	16	18	5	7	9
Holders only, each...	**2**/–	**2/6**	**3**/–	**3/6**	**4**/–	**4/6**	**2/6**	**3**/–	**3/6**
Blades—Bastard, per dozen	**17**/–	**22**/–	**26**/–	**34**/–	**45**/–	**63**/–	**15**/–	**21**/–	**28**/–
Second Cut	**19**/–	**24**/–	**28**/–	**36**/–	**48**/–	**67**/–	**18**/–	**24**/–	**31**/–
Smooth, per dozen	**21**/–	**26**/–	**32**/–	**40**/–	**54**/–	**71**/–	**21**/–	**27**/–	**34**/–

Fig. 1009. RAIL PLANERS. Two-Man Pattern.

Illustration of Grooving Blade.

No. 100 Holder for Flat or Groove File Blades.	**35**/– each
No. 100L Holder (similar but with long Handles for operating in a standing position) ...	**55**/– ,,
No. 100W Weight Attachment (about 24lbs.) for either Holder	**15**/– ,,
Blades for use with same (Flat or Groove) ...	**72**/– per doz.

Fig. 1010. RAIL PLANERS. One-Man Pattern.

Holders No. 105 and No. 110	**10**/– each
Blades for use with same (Bastard or Regular Cut only)	**63**/– per doz.

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TUBE EXPANDERS.

Fig. 1011.

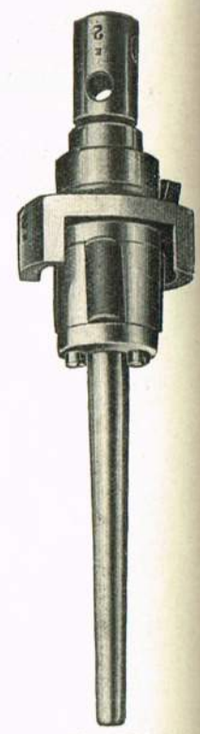

Fig. 1012.

DUDGEON PATTERN TUBE EXPANDERS.

Sizes up to $1\frac{3}{8}''$ made to **Fig. 1011.** Sizes above $1\frac{3}{8}''$ made to **Fig. 1012.**

For tubes	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	inch ext. dia.
Price	**20/–**	**20/–**	**20/–**	**20/–**	**20/–**	**20/–**	**20/–**	**20/–**	**20/–**	**21/6**	each
Extra mandrel	**3/9**	**3/9**	**3/9**	**4/3**	**4/3**	**4/9**	**4/9**	**6/–**	**6/9**	**7/6**	each
Extra rollers	**1/9**	**2/–**	**2/–**	**2/3**	**2/3**	**2/6**	**2/9**	**3/–**	**3/–**	**3/–**	per set of three
For tubes	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	inch ext. dia.
Price	**23/–**	**25/–**	**27/–**	**29/–**	**31/–**	**33/–**	**35/–**	**37/–**	**40/–**	**43/–**	each
Extra mandrel	**8/3**	**9/–**	**10/6**	**12/–**	**12/6**	**13/6**	**13/6**	**15/–**	**15/–**	**16/6**	each
Extra rollers	**3/–**	**3/3**	**3/4**	**3/4**	**3/9**	**3/9**	**4/–**	**4/–**	**4/6**	**4/6**	per set of three
For tubes	3	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{7}{8}$	4	$4\frac{1}{4}$	inch ext. dia.
Price	**48/–**	**52/–**	**55/–**	**56/–**	**62/–**	**64/–**	**69/–**	**74/–**	**76/–**	**90/–**	each
Extra mandrel	**16/6**	**18/–**	**18/–**	**21/–**	**21/–**	**24/–**	**24/–**	**27/–**	**27/–**	**33/–**	each
Extra rollers	**5/3**	**6/–**	**6/–**	**7/–**	**7/–**	**7/9**	**7/9**	**8/6**	**8/6**	**10/–**	per set of three
For tubes	$4\frac{1}{2}$	$4\frac{3}{4}$	5	$5\frac{1}{4}$	$5\frac{1}{2}$	$5\frac{3}{4}$	6	inch ext. dia.			
Price	**110/–**	**130/–**	**160/–**	**180/–**	**200/–**	**225/–**	**250/–**	each			
Extra mandrel	**37/6**	**45/–**	**55/–**	**65/–**	**75/–**	**85/–**	**105/–**	each			
Extra rollers	**12/–**	**14/–**	**17/6**	**21/–**	**24/–**	**27/–**	**30/–**	per set of three			

SOLID BODY SELF-FEEDING AND RELEASING TUBE EXPANDERS.

Suitable for working by hand or with pneumatic tools.

Sizes up to $1\frac{1}{2}''$ made to **Fig. 1013.** Sizes above $1\frac{1}{2}''$ made to **Fig. 1014.**

Ext. dia. of tubes	$\frac{1}{2}$ to $^{14}/_{32}$	$\frac{5}{8}$ to $^{19}/_{32}$	$\frac{3}{4}$ to $^{23}/_{32}$	$\frac{7}{8}$ to $^{27}/_{32}$	1 to $^{30}/_{32}$	$1\frac{1}{8}$ to $1^{2}/_{32}$	inch
Price	**21/–**	**21/–**	**21/–**	**21/–**	**21/–**	**21/–**	each
Extra mandrel	**3/9**	**3/9**	**3/9**	**4/3**	**4/3**	**4/9**	each
Extra rollers	**1/9**	**2/–**	**2/–**	**2/3**	**2/3**	**2/6**	per set
Ext. dia of tubes	$1\frac{1}{4}$ to $1^{6}/_{32}$	$1\frac{3}{8}$ to $1^{10}/_{32}$	$1\frac{1}{2}$ to $1^{14}/_{32}$	$1\frac{5}{8}$ to $1^{19}/_{32}$	$1\frac{3}{4}$ to $1^{23}/_{32}$	$1\frac{7}{8}$ to $1^{27}/_{32}$	inch
Price	**21/–**	**22/–**	**25/–**	**37/6**	**39/–**	**41/–**	each
Extra mandrel	**4/9**	**6/–**	**6/9**	**7/6**	**8/3**	**9/–**	each
Extra rollers	**2/9**	**3/–**	**3/–**	**3/–**	**3/–**	**3/3**	per set
Ext. dia. of tubes	2 to $1^{31}/_{32}$	$2\frac{1}{8}$ to $2\frac{1}{8}$	$2\frac{1}{4}$ to $2\frac{1}{4}$	$2\frac{3}{8}$ to $2\frac{3}{8}$	$2\frac{1}{2}$ to $2\frac{1}{2}$	$2\frac{5}{8}$ to $2\frac{5}{8}$	inch
Price	**44/–**	**47/6**	**47/6**	**52/6**	**52/6**	**59/–**	each
Extra mandrel	**10/6**	**12/–**	**12/6**	**13/6**	**13/6**	**15/–**	each
Extra rollers	**3/4**	**3/4**	**3/9**	**3/9**	**4/–**	**4/–**	per set
Ext. dia. of tubes	$2\frac{3}{4}$ to $2\frac{3}{4}$	$2\frac{7}{8}$ to $2^{13}/_{16}$	3 to $2^{15}/_{16}$	$3\frac{1}{8}$ to $3^{1}/_{16}$	$3\frac{1}{4}$ to $3^{3}/_{16}$	$3\frac{3}{8}$ to $3^{5}/_{16}$	inch
Price	**59/–**	**65/–**	**65/–**	**72/–**	**72/–**	**79/–**	each
Extra mandrel	**15/–**	**16/6**	**16/6**	**18/–**	**18/–**	**21/–**	each
Extra rollers	**4/6**	**4/6**	**5/3**	**6/–**	**6/–**	**7/–**	per set
Ext. dia. of tubes	$3\frac{1}{2}$ to $3^{7}/_{16}$	$3\frac{5}{8}$ to $3^{9}/_{16}$	$3\frac{3}{4}$ to $3^{11}/_{16}$	$3\frac{7}{8}$ to $3^{13}/_{16}$	4 to $3^{15}/_{16}$	inch	
Price	**79/–**	**86/–**	**86/–**	**100/–**	**100/–**	each	
Extra mandrel	**21/–**	**24/–**	**24/–**	**27/–**	**27/–**	each	
Extra rollers	**7/–**	**7/9**	**7/9**	**8/6**	**8/6**	per set	

When ordering, please say if mandrels are required with round or square heads.

Fig. 1013

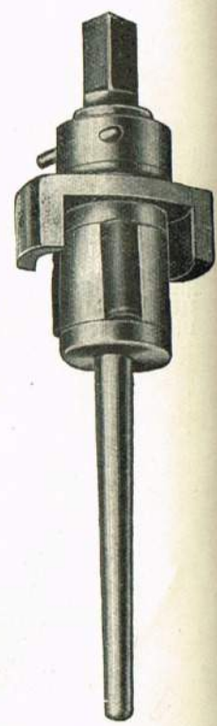

Fig. 1014

RATCHET SPANNERS FOR TUBE EXPANDERS.

Fig. 1015.

Square hole	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	inch
Length	$7\frac{1}{2}$	10	11	14	17	19	20	23	28	29	inch
Price	**15/–**	**18/–**	**21/–**	**24/6**	**28/6**	**31/6**	**37/6**	**43/–**	**60/–**	**75/–**	each

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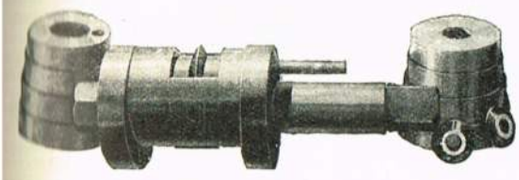
TUBE CUTTERS, EXPANDERS, Etc.

Fig. 1016. SIMPLEX INTERNAL TUBE CUTTER.



With it about 30 high-pressure or 60 low-pressure tubes may be cut in one hour by one man.

A great saving is effected by using this tool, as only a hammer and punch are required to remove the short ends left in the tube plate. The tool saves its cost almost on the first job.

The tool cannot damage the tube plate, as no hand tools are used, such as fishbacks, crosscuts, etc. The tube plate is untouched, therefore it cannot get damaged.

Each complete tool will cut two different sized tubes. A card with directions for use is sent with all tools.

PRICES AND PARTICULARS.

No. 3.	To cut $2\frac{1}{2}''$ and $2\frac{3}{4}''$ external diameter tubes	**£12 0 0**
No. 4.	,, $2\frac{3}{4}''$ and $3''$,, ,, ...	**£13 0 0**
No. 5.	,, $3''$ and $3\frac{1}{4}''$,, ,, ...	**£14 0 0**
No. 6.	,, $3\frac{1}{4}''$ and $3\frac{1}{2}''$,, ,, ...	**£15 0 0**
No. 7.	,, $3\frac{3}{4}''$ and $4''$,, ,, ...	**£16 0 0**

No. 7 is suitable for Babcock and Wilcox Tubes. Three cutter wheels are supplied with each tube.

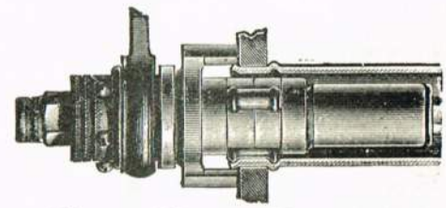


Fig. 1017. TUBE RECESSING TOOL.

Sizes refer to external diameter of tubes.

$1\frac{5}{8}''$	$1\frac{3}{4}''$	$1\frac{7}{8}''$	$2''$	$2\frac{1}{4}''$	$2\frac{1}{2}''$	$2\frac{3}{4}''$	$3''$	$3\frac{1}{4}''$	$3\frac{1}{2}''$	$3\frac{3}{4}''$	$4''$
£15	**£15**	**£15**	**£15 10**	**£16**	**£16 10**	**£17**	**£18**	**£19**	**£21**	**£23**	**£26**

PRICE of EXTRA CAGES and ROLLERS for size above, to fit in tool, thus making the tool do two sizes.

60/–	**62/–**	**64/–**	**66/–**	**68/–**	**70/–**	**72/–**	**74/–**	**76/–**	**78/–**	**80/–**	**84/–**
Rollers, per Set—											
8/–	**8/–**	**8/8**	**9/4**	**10/–**	**10/8**	**11/4**	**12/–**	**12/–**	**14/–**	**16/–**	**18/–**

The Recessing Tools are made to order only.

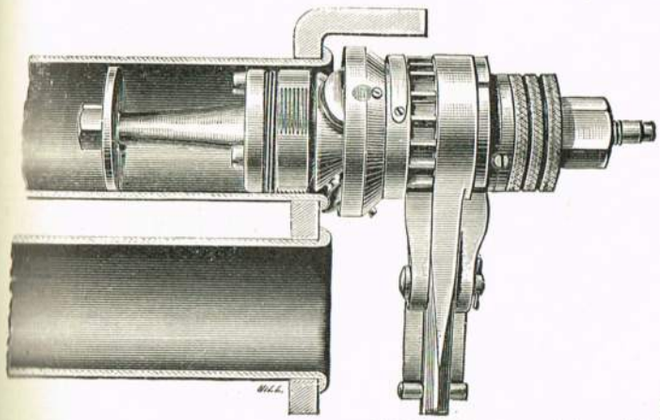


Fig. 1018. PATENT TUBE BEADER.

This tool does the work cheaper and better than it can be done by any other method.

The outward pressure of the rollers which is obtained by putting the axles at an angle to the tube instead of square, gradually stretches the flange over without fracture or any sort of jumping action.

It is self-feeding, easily fixed and released, and of the very best material and workmanship throughout.

The head is made to swivel, so as to accommodate itself to the unevenness of the tube plate and tubes.

In marine, locomotive, and agricultural engineering practice, the tool has been largely adopted.

This tool is also made to work by power through a flexible shaft.

PRICE LIST.

[Of Beaders complete, with hammer, key, extra set of rollers, etc.

External diameter :—

$1\frac{1}{8}''$	$1\frac{5}{8}''$	$1\frac{3}{4}''$	$1\frac{7}{8}''$	$2''$	$2\frac{1}{4}''$	$2\frac{1}{2}''$	$2\frac{3}{4}''$	$3''$	$3\frac{1}{4}''$	$3\frac{1}{2}''$	$3\frac{3}{4}''$	$4''$	$4\frac{1}{4}''$
£12	**£12**	**£12**	**£13**	**£13 10**	**£14**	**£14 10**	**£15**	**£16**	**£17 10**	**£19**	**£21**	**£24**	**£28**

Rollers, per set—

$1\frac{1}{8}''$	$1\frac{5}{8}''$	$1\frac{3}{4}''$	$1\frac{7}{8}''$	$2''$	$2\frac{1}{4}''$	$2\frac{1}{2}''$	$2\frac{3}{4}''$	$3''$	$3\frac{1}{4}''$	$3\frac{1}{2}''$	$3\frac{3}{4}''$	$4''$	$4\frac{1}{4}''$
3/8	**3/10**	**4/–**	**4/6**	**5/–**	**5/6**	**6/–**	**7/–**	**8/–**	**9/–**	**10/–**	**11/–**	**12/–**	**14/–**

STANDARD SIZED BEADERS.

Are made to take tubes of the following thicknesses :

IN.		B.W.G.	IN.		B.W.G.	IN.		B.W.G.	IN.		B.W.G.
$1\frac{1}{8}$	...	16, 17, 18	$1\frac{5}{8}$	...	12, 13, 14	$2\frac{1}{4}$	...	10, 11, 12	$3\frac{1}{4}$	...	8, 9, 10
$1\frac{1}{4}$	...	15, 16, 17	$1\frac{3}{4}$	...	11, 12, 13	$2\frac{1}{2}$	...	9, 10, 11	$3\frac{1}{2}$	...	8, 9, 10
$1\frac{3}{8}$	...	14, 15, 16	$1\frac{7}{8}$	...	11, 12, 13	$2\frac{3}{4}$	...	9, 10, 11	$3\frac{3}{4}$	...	8, 9, 10
$1\frac{1}{2}$	...	13, 14, 15	2	...	10, 11, 12	3	...	9, 10, 11	4	...	7, 8, 9

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TUBE CUTTERS AND EXPANDERS.

Fig. 1019. PATENT INTERNAL TUBE CUTTER.

This Cutter is specially designed for removing old tubes out of boilers, by cutting them off inside the tube plate, and trimming off new tubes to length outside tube plate. Works with a ratchet and constant feed. Cuts through a medium tube in one minute.

Price List, complete, with extra Set of Rollers and Wrench.

External diameter, inches	$1\frac{5}{8}$ and $1\frac{3}{4}$	$1\frac{3}{4}$ and $1\frac{7}{8}$	$1\frac{7}{8}$ and 2	2 and $2\frac{1}{4}$	$2\frac{1}{4}$ and $2\frac{1}{2}$	$2\frac{1}{2}$ and $2\frac{3}{4}$
Extreme range	$1\frac{3}{8}$ to $1\frac{13}{16}$	$1\frac{1}{2}$ to $1\frac{15}{16}$	$1\frac{19}{32}$ to $2\frac{1}{16}$	$1\frac{11}{16}$ to $2\frac{5}{16}$	$1\frac{15}{16}$ to $2\frac{9}{16}$	$2\frac{3}{16}$ to $2\frac{13}{16}$
Price complete	**£13 0 0**	**£13 0 0**	**£13 0 0**	**£13 10 0**	**£14 0 0**	**£14 10 0**
Extra cutters, per set	**4/4**	**4/4**	**4/4**	**4/8**	**5/–**	**5/4**
External diameter, inches	$2\frac{3}{4}$ and 3	3 and $3\frac{1}{4}$	$3\frac{1}{4}$ and $3\frac{1}{2}$	$3\frac{1}{2}$ and $3\frac{3}{4}$	$3\frac{3}{4}$ and 4	4 and $4\frac{1}{4}$
Extreme range	$2\frac{3}{8}$ to $3\frac{1}{8}$	$2\frac{9}{16}$ to $3\frac{3}{8}$	$2\frac{3}{4}$ to $3\frac{5}{8}$	3 to $3\frac{7}{8}$	$3\frac{1}{4}$ to $4\frac{1}{8}$	$3\frac{3}{8}$ to $4\frac{3}{8}$
Price complete	**£15 0 0**	**£15 10 0**	**£15 10 0**	**£19 0 0**	**£20 0 0**	**£22 0 0**
Extra cutters, per set	**5/8**	**6/–**	**6/6**	**7/–**	**8/–**	**10/–**

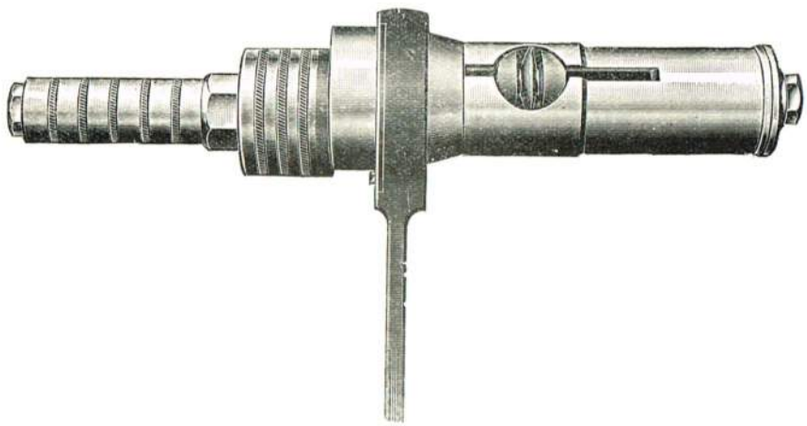

Fig. 1020.

SINGLE ROLLER INTERNAL TUBE CUTTER.

As this Cutter has only one roller, this roller can be made much larger and stronger than is possible with a three-roller cutter. The tube is cut cleaner, with less burr. It is better than the three-roller cutter for all sizes, and very much better for sizes from $1\frac{5}{8}''$ to 2″, and the only make possible for the smallest sizes and very thick tubes.

It will not trim tubes outside the tube plate, however, as the three roller cutter will.

External diameter, inches	$1\frac{1}{4}$ to $1\frac{3}{8}$	$1\frac{3}{8}$ to $1\frac{1}{2}$	$1\frac{1}{2}$ to $1\frac{3}{4}$	$1\frac{5}{8}$ to $1\frac{7}{8}$	$1\frac{3}{4}$ to $2\frac{1}{8}$	$1\frac{7}{8}$ to $2\frac{3}{8}$	2 to $2\frac{1}{2}$
Extreme range	1 to $1\frac{13}{32}$	$1\frac{1}{8}$ to $1\frac{9}{16}$	$1\frac{1}{4}$ to $1\frac{27}{32}$	$1\frac{3}{8}$ to $1\frac{31}{32}$	$1\frac{15}{32}$ to $2\frac{7}{32}$	$1\frac{19}{32}$ to $2\frac{7}{16}$	$1\frac{11}{16}$ to $2\frac{19}{32}$
Price complete	**£16 0 0**	**£16 0 0**	**£16 0 0**	**£16 0 0**	**£16 0 0**	**£16 10 0**	**£17 0 0**
Extra cutters, each	**2/–**	**2/–**	**2/–**	**2/3**	**2/6**	**3/–**	**3/3**
External diameter, inches		$2\frac{1}{4}$ to $2\frac{3}{4}$	$2\frac{1}{2}$ to $3\frac{1}{8}$	$2\frac{3}{4}$ to $3\frac{1}{2}$	3 to $3\frac{3}{4}$	$3\frac{1}{4}$ to 4	$3\frac{1}{2}$ to $4\frac{1}{4}$
Extreme range		$1\frac{15}{16}$ to $2\frac{29}{32}$	$2\frac{3}{16}$ to $3\frac{9}{32}$	$2\frac{3}{8}$ to $3\frac{21}{32}$	$2\frac{9}{16}$ to $3\frac{29}{32}$	$2\frac{3}{4}$ to $4\frac{3}{32}$	3 to $4\frac{5}{16}$
Price complete		**£17 10 0**	**£18 0 0**	**£19 0 0**	**£20 10 0**	**£22 0 0**	**£24 0 0**
Extra cutters, each		**3/9**	**4/–**	**4/3**	**4/9**	**5/–**	**5/6**

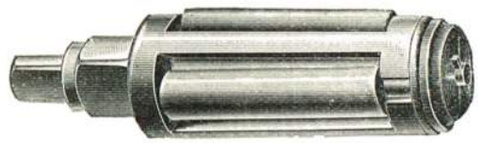

Fig. 1021. THOMPSON'S PATTERN TUBE EXPANDERS.

External diam. of tubes, inches	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{5}{8}$	$1\frac{11}{16}$	$1\frac{3}{4}$	$1\frac{13}{16}$	$1\frac{7}{8}$	$1\frac{15}{16}$	2	$2\frac{1}{16}$	$2\frac{1}{8}$	$2\frac{1}{4}$
Will expand internally from, inches	$1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{5}{8}$	$1\frac{11}{16}$	$1\frac{3}{4}$	$1\frac{13}{16}$	$1\frac{7}{8}$	2
To, inches	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{5}{8}$	$1\frac{11}{16}$	$1\frac{3}{4}$	$1\frac{13}{16}$	$1\frac{7}{8}$	$1\frac{15}{16}$	2	$2\frac{1}{16}$	$2\frac{1}{8}$	$2\frac{1}{4}$
Price complete	**35/–**	**35/–**	**35/–**	**38/–**	**38/–**	**40/–**	**40/–**	**42/–**	**42/–**	**44/–**	**44/–**	**46/–**
Extra rollers per set, or mandrel	**9/–**	**9/–**	**10/–**	**10/–**	**10/–**	**10/6**	**10/6**	**11/–**	**11/–**	**12/–**	**12/–**	**12/6**
External diam. of tubes, inches		$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4
Will expand internally from, inches		$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$2\frac{11}{16}$	$2\frac{3}{4}$	$2\frac{7}{8}$	$3\frac{1}{8}$	$3\frac{3}{8}$	$3\frac{5}{8}$
To, inches		$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{11}{16}$	$2\frac{13}{16}$	$2\frac{15}{16}$	3	$3\frac{1}{8}$	$3\frac{3}{8}$	$3\frac{5}{8}$	$3\frac{7}{8}$
Price complete		**48/–**	**50/–**	**52/–**	**54/–**	**56/–**	**58/–**	**60/–**	**63/–**	**68/–**	**74/–**	**84/–**
Extra rollers, per set, or mandrel		**13/–**	**13/–**	**15/–**	**15/–**	**15/–**	**16/–**	**18/–**	**20/–**	**22/–**	**24/–**	**26/–**

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TUBE CLEANERS.

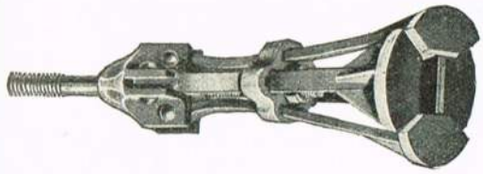

Fig. 1022. PATENT TUBE SCRAPER.

This scraper is pushed through the tube quite loosely, and scrapes only when being withdrawn. The arms are made from carbon steel stampings, are flexible, and so accommodate themselves to any irregularities of the tube.

By means of the adjustable sleeve the scraper can be made to fit the tube as loosely or as tightly as desired.

When Ordering, state the Internal diameter of the Tube beyond the swelled part at end.

Used in conjunction with No. 1 or No. 2 Brush.

Size Pipes, inches...	$1\frac{1}{8}$—$2\frac{1}{2}$	$2\frac{5}{8}$—$2\frac{3}{4}$	$2\frac{7}{8}$—3	$3\frac{1}{8}$—$3\frac{1}{4}$	$3\frac{3}{8}$—$3\frac{1}{2}$	$3\frac{5}{8}$—$3\frac{3}{4}$
Price each	**10/-**	**10/6**	**11/-**	**12/-**	**12/9**	**13/6**

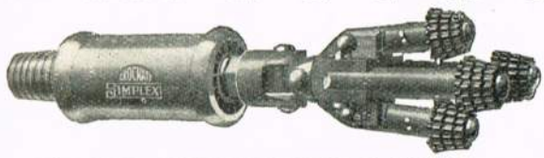

Fig. 1024. TURBINE TUBE CLEANER.

The Turbine Tube Cleaner, illustrated, is made in sizes from 2 ins. upwards, and is driven by a turbine suitable for either air, steam, or water at about 100 lbs. pressure.

The cleaning head is detachable, so that special cutters or brushes may be attached to suit different conditions, and the universal joint makes the tool suitable for use in curved tubes, such as in Stirling Boilers.

It is suitable also for Babcock Tubes, Economiser Tubes, and any other kind of pipes having hard scale.

Size	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	inch.
Price	**£9-0-0**	**£10-10-0**	**£12-0-0**	**£13-10-0**	**£15-0-0**	**£15-0-0**	each.

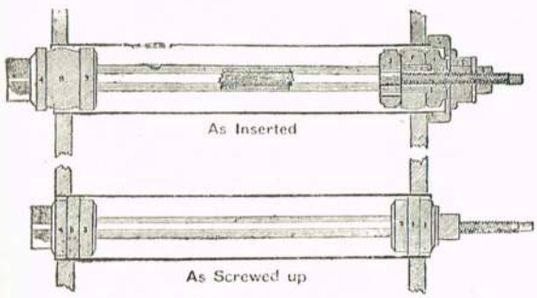

Fig. 1026. TUBE STOPPER.

This Stopper consists of Four Iron Discs, collared on the inside to grip white metal rings at the back and front ends of Tube, and kept apart by a length of iron tubing; the back end disc being tapped and screwed on to the end of rod.

The parts forming the shield are taken away after screwing up, and put on to another stopper ready for use.

Should there not be room in stokehold, between bulkhead and front of boiler, the stoppers can be supplied jointed in the middle.

The Stopper can easily be put into a leaky tube whilst the fires are under weigh and steam up, the white metal rings being about a quarter of an inch less than the internal diameter of tube.

Both the Rings can be expanded inside the tubes directly on the tube plates, thereby effecting a complete stoppage of the leaky tube from end to end.

It is compartively safe to apply, as there is a Shield provided, and immediately the Stopper is put into the tube, this covers the tube end, and does not prevent the screwing up.

By unscrewing the end discs the stopper comes asunder, and to fit it again only requires new rings.

Give length of Tube and inside diameters at plain and swelled ends.

Price **35/-**, plus **3/6** per foot tubing.

Fig. 1023. CONDENSER TUBE SCRAPER.

Some waters leave a heavy deposit on the inside of condenser tubes which greatly depreciates their condensing value, and causes a marked loss of vacuum. Such deposit may be removed and the efficiency restored by using this Scraper.

It is made of tempered steel and will remove fairly hard scale. By means of the screw and cone on the central rod the cutting edges are expanded to bear on the tube all round, while, owing to its form, the tool cannot tilt and damage the tube.

Flexible Rods.—For condensers with little room at the ends, rods with linked joints and sockets to fit cleaners are supplied.

To remove slime and mud, Brushes with hardened Wire Bristles are supplied

Size Pipes, inches ...	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Price each	**9/6**	**9/6**	**9/6**

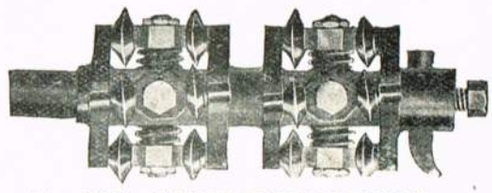

Fig. 1025. WATER TUBE CLEANER.

For Removing Hard Scale from the inside of Boiler Tube Economiser or other Pipes.

The Cleaner only requires to be passed through a tube once to remove all the scale.

The Wheel Cutters are mounted on journals set at an angle with centre line of Tube, and cause the Cleaner to travel spirally through the Tube, splitting and breaking up the scale. The large number of Wheel Cutters, each travelling in its own path, effectually cleans the tube.

Springs are fitted below the journals of the Wheel Cutters, which can thus accommodate themselves to irregularities in the diameter of the Tube. The pressure and range of these Springs can be adjusted as desired.

The Cutter at fore end of the Cleaner is used when scale is extra thick. It removes the rough parts, leaving a clear path for the Revolving Wheel Cutters. This Cleaner may be worked by Hand or Power.

Tubes are supplied of any required length, with hand wheel to drive the tool; also guide bracket to fix on front of tube ends.

For Working by Power, the Driving Shaft can be coupled direct to the Spindle of an Electric Drill. The Drill is then supported by the guide bracket and the tube slides in it as it feeds forward.

For Tubes $3\frac{3}{4}''$ inside diameter, **£10 16 0**
,, ,, 4″ ,, ,, **£12 0 0**

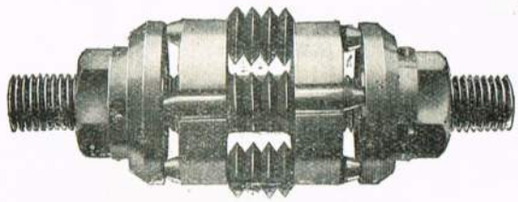

Fig. 1027. WATER TUBE CLEANER.

FOR STIRLING BOILER TUBES.

This Cleaner works on the same principle as that for Babcock Tubes, but is made as short as possible, so as to pass round the bends in the tubes.

The Cutters are held up to their work by springs under the Cutter Spindles, and are adjustable by means of the coned washers mounted on the main spindle.

This Cleaner is very suitable for driving by means of a flexible shaft.

For Tubes $3\frac{3}{4}''$ inside diameter **£10 16 0**
,, ,, 4″ ,, ,, **£12 0 0**

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TUBE BRUSHES.

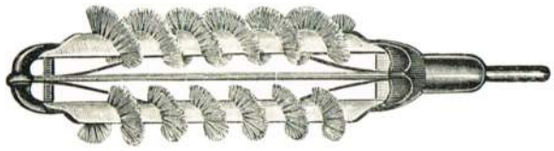

Fig. 1028. SELF-EXPANDING TUBE BRUSHES.

Brushes can be replaced when worn out.

Internal diameter of tube, ins.	2	2¼	2½	2¾	3
Brush complete, each ...	**10/–**	**10/6**	**11/–**	**11/6**	**11/8**
Extra brushes, each	**8/–**	**8/2**	**8/6**	**9/–**	**9/4**

Internal diameter of tube, ins.	3¼	3½	3¾	4
Brush complete, each ...	**12/–**	**12/6**	**13/–**	**13/6**
Extra brushes, each	**9/8**	**10/–**	**10/6**	**11/–**

Fig. 1029. TUBE BRUSHES.

Made of steel or brass wire and hair whalebone.
Brass or flat steel wire brushes can be supplied.

Size	1½ to 2	2¼	2½	2¾
Price per doz.– Brass wire...	**8/3**	**8/9**	**9/9**	**10/3**
,, ,, Steel wire	**7/–**	**7/6**	**7/9**	**8/–**
,, ,, Stiff hair ...	**10/3**	**10/9**	**12/–**	**16/–**

Size	3	3¼	3½	3¾	4
Price per doz.– Brass wire...	**10/9**	**11/3**	**12/3**	**13/3**	**14/3**
,, ,, Steel wire	**8/3**	**8/6**	**8/9**	**9/–**	**9/6**
,, ,, Stiff hair ...	**18/3**	**19/9**	**23/–**	**30/6**	**35/–**

Sockets and welding pieces for above, **15/–** per doz.
Twisted wire handles, with screwed sockets on end—6ft., **39/–**; 9ft., **48/–**; 12 ft., **57/–**; per doz.
Tube brushes are screwed ½ Whitworth or ¼ gas. Other sizes, **6/–** per doz. extra.

Fig. 1030. CONDENSER TUBE BRUSHES.

For ⅜″ to ¾″ tubes.

Steel wire	**30/–** per doz.
Brass wire	**36/–** ,,

Fig. 1031. SELF ADJUSTING TUBE BRUSH.

Specially designed to meet the demand for a brush to stand hard wear. The arms are made of stiff steel, and their elasticity permits the brush to adjust itself to any inequalities of the tube, whilst maintaining constant surface pressure. Bristles made of hardened steel.

Size of tube, inches ...	1½–2	2⅛–2⅞	3–3⅜	3½–4
Price each	**8/–**	**8/6**	**9/–**	**10/–**

Fig. 1031a. ADJUSTABLE TUBE BRUSH.

The bristles are hardened steel, and, being short, do not bend down and make the brush useless after being pushed through a few tubes, as happens with the ordinary brush.

A fly nut on each end of brush protects the bristles when entering the tube, and by screwing it up the brush can be expanded. This enables engineers to adjust the brush to suit their requirements. It also enables the brush to fit the tube and clean it efficiently right to the end of the life of the brush. Sufficient elasticity has been provided in the brush to clean the tube thoroughly while adapting itself to all inequalities.

Size of tube, inches ...	1½–2	2⅛–2⅞	3–3⅜	3½–4
Price each	**8/–**	**8/6**	**9/–**	**10/–**

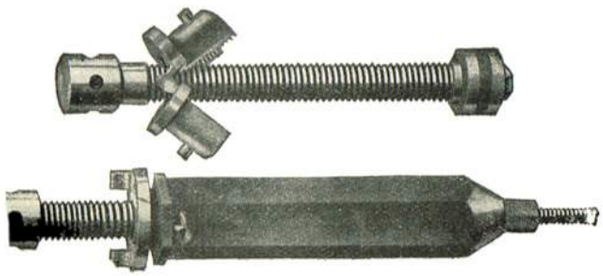

Fig. 1032. PUTTY PUMP OR RED LEAD INJECTOR.

Cammell Laird's Patent.

By means of the bayonet catch, the screw and nut through which it works can be withdrawn instantly, leaving the pump ready to be filled.

The hinged split nut can be opened and slid over the screw, and thus save the time otherwise spent in unscrewing it.

Instead of being screwed internally, the pump is bored out smooth and is fitted with a leather-packed piston.

The removable nipple at the nose of the pump can be replaced by others of different lengths, diameters and bores.

It carries a greater quantity of red lead with less weight than the ordinary style.

The experience of its use in some of the largest shipyards in the country shows that it effects a very considerable saving in time.

Size 1.	8″ long	Price	**£3 10 0** each
Size 2.	6″ ,, ... ,,		**£3 0 0** ,,

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BAR AND TUBE BENDERS.

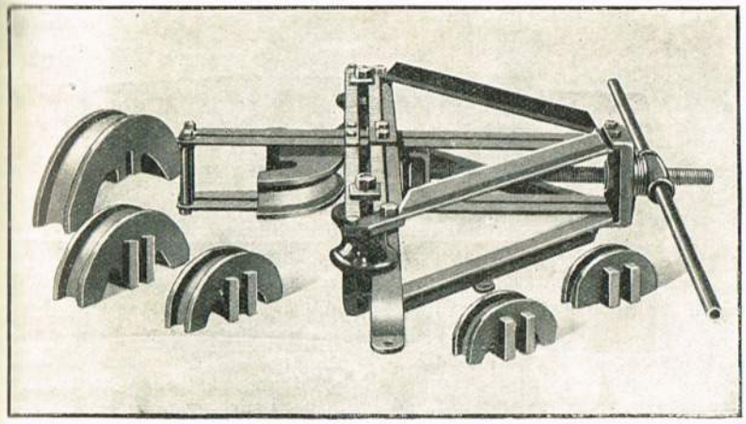
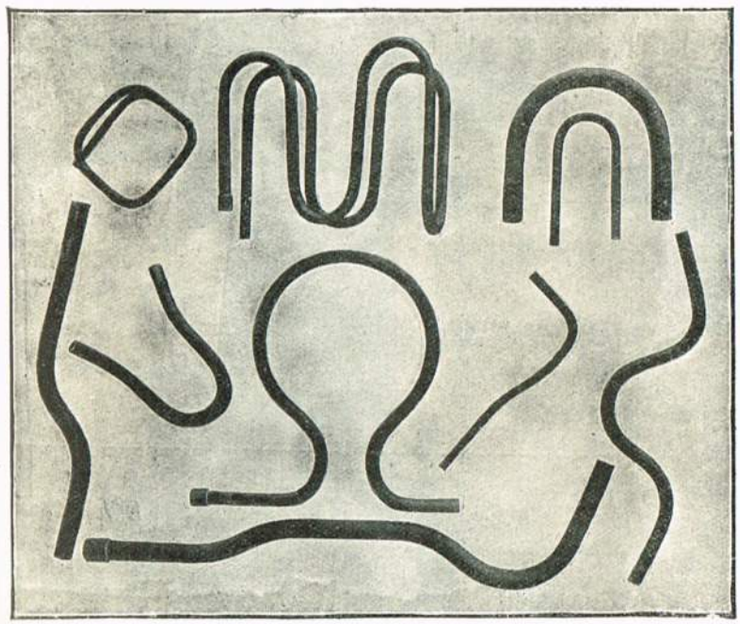


Fig. 1040. Tube Bending Machine.



Various illustrations of pipes bent with this bender.

Fig. 1040.

PATENT TUBE BENDER.

Is a simple, reliable and efficient machine specially designed for bending in a cold state tubes suitable for gas, steam, hydraulic and high-pressure work; also for iron, steel, brass, copper, and conduit tubes, etc. (not thinner than 10 B.W.G.).

They will also bend solid bars up to $1\frac{1}{2}''$ for re-inforced concrete work.

Without Heating or Filling.

Having a free or open frame any length of tube may be bent easily. It may be taken to the job and the exact bends made upon the spot. Laid upon a plank or bench a youth can operate it quite easily.

Used by Government departments, railway companies, shipbuilders, and the largest engineering firms at home and abroad.

No. 1 Size.—Complete with 6 blocks, to bend $\frac{1}{8}''$, $\frac{1}{4}''$, $\frac{3}{8}''$, $\frac{1}{2}''$, $\frac{3}{4}''$ and $1''$ gas or steam tubes (or 5 blocks to bend $\frac{5}{8}''$, $\frac{3}{4}''$, $\frac{7}{8}''$, $1''$ and $1\frac{1}{4}''$ conduit tubes).

Price ... **£12 10 0** nett.

No. 2 Size.—Complete with 6 blocks, to bend $\frac{1}{2}''$, $\frac{3}{4}''$, $1''$, $1\frac{1}{4}''$, $1\frac{1}{2}''$ and $2''$ gas and steam tubes (or 7 blocks, $\frac{5}{8}''$, $\frac{3}{4}''$, $\frac{7}{8}''$, $1''$, $1\frac{1}{4}$, $1\frac{1}{2}''$, and $2''$ conduit blocks.)

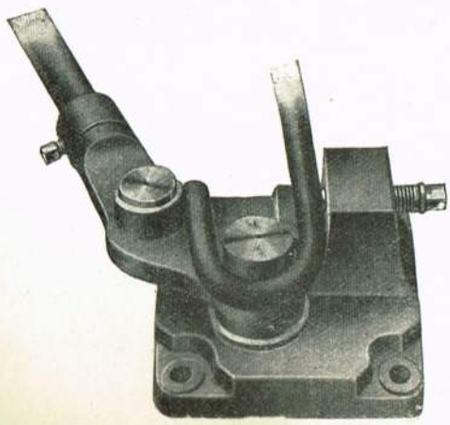
Price ... **£12 10 0** nett.

These machines are sent with gas and steam former blocks unless otherwise ordered.

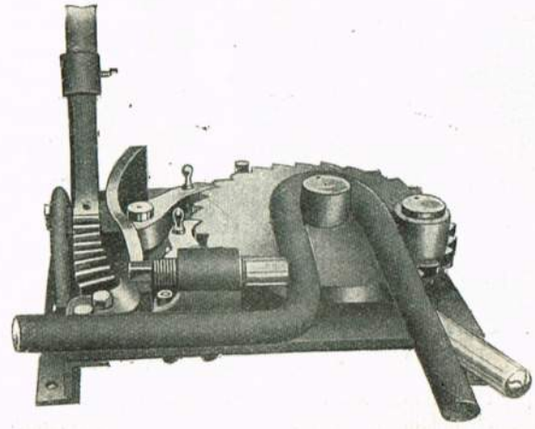
Fig. 1041.

PATENT BAR-BENDING MACHINE.

Size	Will bend rounds cold up to inches	Will bend square cold up to inches	Approx. weight lbs.	Price each £ s. d.
1	$\frac{5}{8}$	$^{9}/_{16}$	26	**1 15 0**
2	$\frac{7}{8}$	$\frac{3}{4}$	40	**2 7 6**
3	1	$^{15}/_{16}$	66	**3 7 6**
4	$1\frac{3}{8}$	$1\frac{1}{4}$	165	**12 0 0**
5	$1\frac{3}{4}$	$1^{9}/_{16}$	220	**16 5 0**



Sizes 1, 2, 3.



Figs. 1041. **Sizes 4 and 5.**

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PIPE BENDING MACHINES.

The "Kennedy" Patent Bending Machines for bending cold tubes and rods of various sections, will bend welded, butt jointed and seamless tubing, also round, flat, angle, tee, and channel bars in iron, brass, copper, etc.

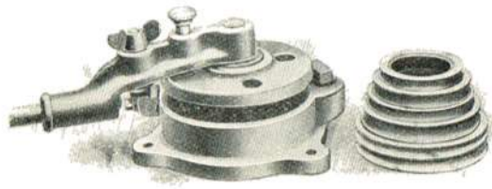

Fig. 1042. No. 1 Pipe Bending Machine. Will bend up to $\frac{1}{2}''$ iron gas barrel or equivalent. Radii $1\frac{1}{4}''$ to $2\frac{3}{8}''$, with 6 Pipe Rings.

Price, **£4 4s.**

Fig. 1045. No. 2a Special Pipe Bending Machine. Operated by worm and worm wheel. Will bend iron gas barrel up to $1\frac{1}{2}''$ with addition of special deep grooved formers. Will bend up to 2″ copper or brass tubes, angle sections up to $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{1}{4}''$, and similar strengths in channels, tees, flats, etc. Weight, with stand to floor, $7\frac{3}{4}$ cwt.; without stand, 5 cwt. Radii $3\frac{1}{2}''$ to 6″.

Prices without stand, **£46**; with stand, **£53 10s.**, with 6 Pipe Rings.

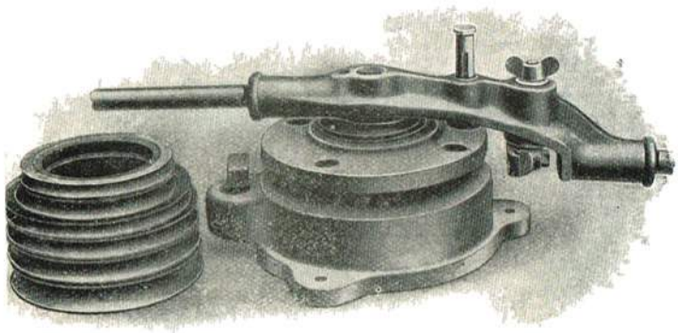

Fig. 1043. No. 2 Pipe Bending Machine. Will bend up to 1″ iron gas barrel or equivalent. Radii $2\frac{3}{8}''$ to 4″, with 6 Pipe Rings.

Price, **£10 5s.**

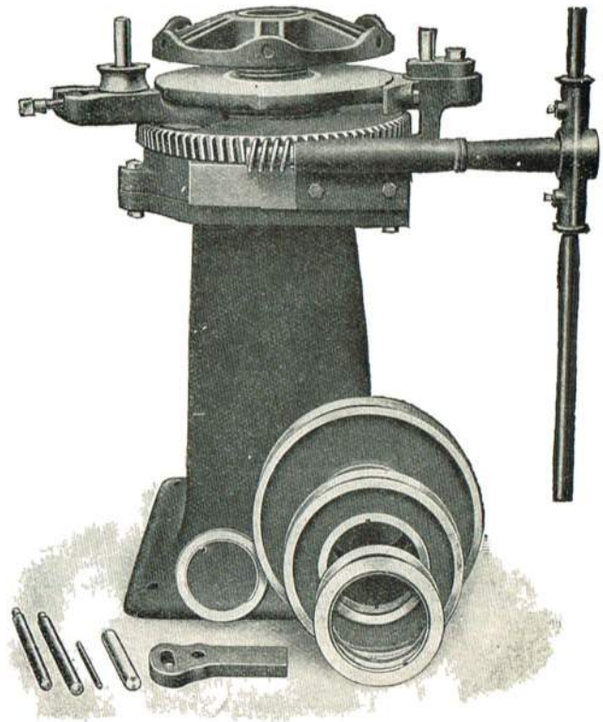

Illustration of No. 2a and No. 3 Pipe Bending Machine.

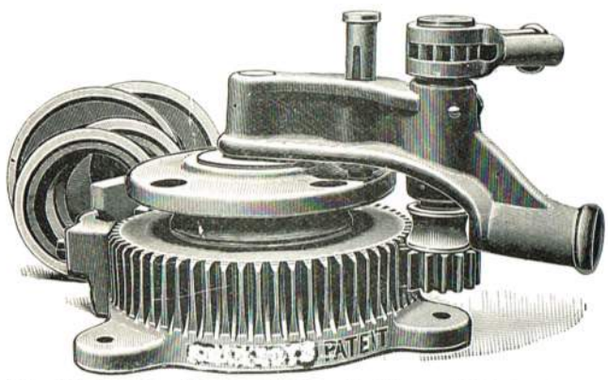

Fig. 1044. Geared Pipe Bending Machine. Will bend same pacity as No. 2 ungeared model and in addition will also bend hydraulic pipe. Radii $2\frac{3}{8}''$ to 4″. Complete with 6 Pipe Rings.

Price, **£19 10s.**

Fig. 1045a. Pipe Bending Machine. Same design as No. 2a listed above, but slightly heavier. Will bend iron gas barrel up to 2″ and copper and brass tube up to 2″. Radii $3\frac{1}{2}''$ to 6″.

Prices, without stand, **£47**; with stand **£54 10s.**

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BAR AND PIPE BENDING MACHINES.

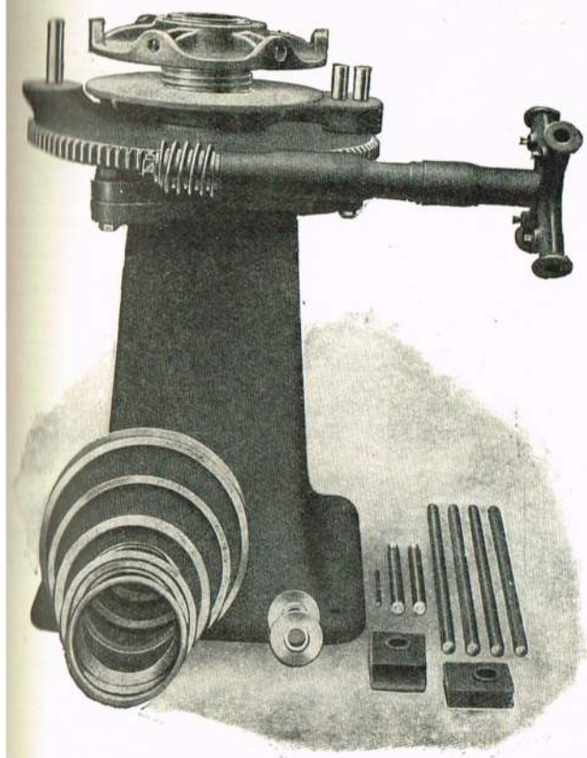

Fig. 1046.

No. 3a. Pipe Bending Machine. Same design as No. 2a and No. 3, worm and worm wheel operation. Will bend up to $2\frac{1}{4}$ iron gas barrel and copper and brass tube up to $2\frac{1}{4}''$ diameter. Will also bend angle sections, $2'' \times 2'' \times \frac{5}{16}''$, and similar strength in channels, tees, and flat strip, either flat or edgeways. Weight without stand, $6\frac{3}{4}$ cwt.; with stand to floor, $9\frac{1}{2}$ cwt. Radii 4″ to $6\frac{1}{2}''$.

Prices, without Stand, **£58 10s.**; with stand, **£65 10s.**

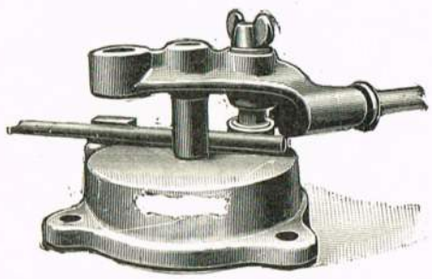

Fig. 1047. No. 1 Bar Bending Machine. Suitable for bending bars up to $\frac{5}{8}''$ diameter, $\frac{1}{2}''$ radius, at any angle. Weight 25 lbs.

Price **£3 0 0.**

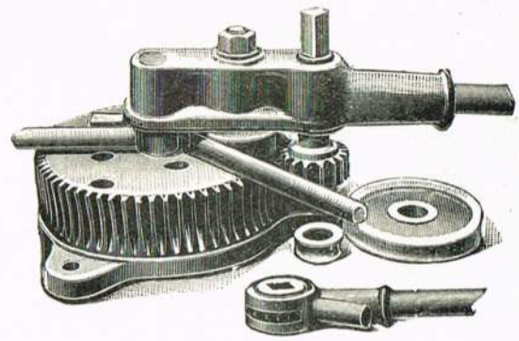

Fig. 1048. No. 2 Bar Bending Machine. Suitable for bending bars up to 1″ diameter, $\frac{3}{4}''$ radius. On light work the gearing may be removed, and used with direct leverage. Bars can be set to any angle. Price **£14 0 0.**

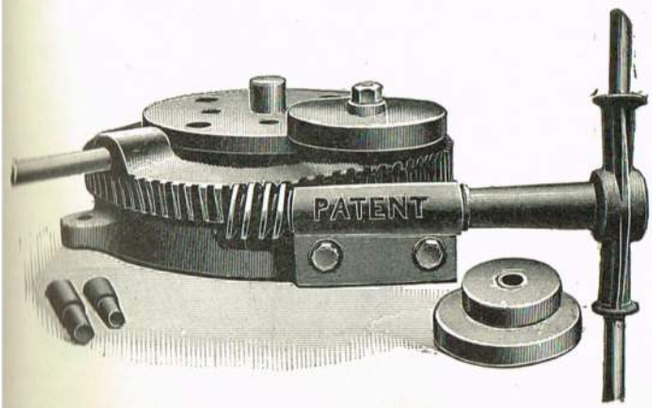

Fig. 1049. No. 2a Worm Gear Bar Bending Machine. Suitable for bending bars up to $1\frac{1}{2}''$ diameter, 1″ radius. Three bending rollers are supplied, 6″, 8″ and 12″, for bending 1″, $1\frac{1}{4}''$ and $1\frac{1}{2}''$ bars. Will also bend $1\frac{1}{4}''$ square bars. Weight, without stand, $3\frac{1}{4}$ cwt.; with stand, 4 cwt.

Prices, without stand, **£26 10s.**; with stand, **£34.**

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TELEGRAPH TOOLS.

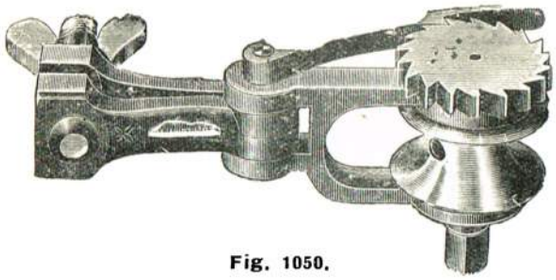

Fig. 1050.

SOLID STEEL DRAW VICES WITH RATCHET.

Length over all, 8½".

Price ... **35/-** each.

Fig. 1051.

DRAW VICES WITH RATCHET.

Width, inches ...	4	5	6	8	10	12
Length over all, inches	7¼	9	10¼	13¼	16½	19
Will grip wires up to diameter, inches ...	⅛	3/16	¼	⅜	7/16	⅝
Price each	**20/-**	**25/-**	**32/6**	**50/-**	**80/-**	**100/-**

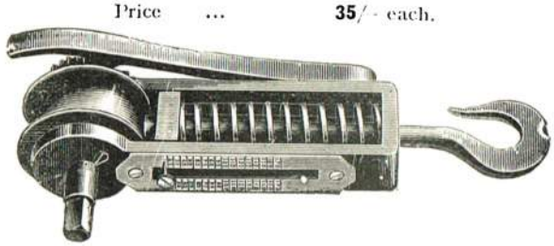

Fig. 1052.

TENSION RATCHETS.

To indicate, lbs.	150	170	200	400	650	750	1000
Price each ...	**35/-**	**35/-**	**35/-**	**60/-**	**75/-**	**85/-**	**100/-**

Fig. 1053.

RATCHETS FOR DRAW TONGS.

Light, **8/6** each. Medium, **10/6** each.

Heavy, **15/-** each.

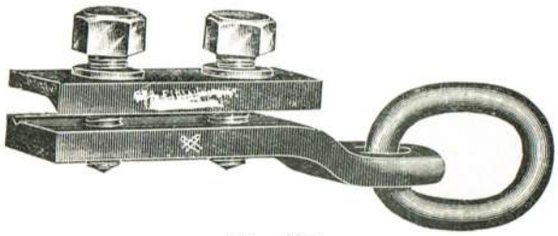

Fig. 1055.

FLAT PULL-ALONG CLAMPS.

With hook or clamp.

Price ... **15/-** each.

Fig. 1054.

SLIDING DRAW TONGS.

In various sizes. For wires up to ⅝".

Price ... ... **4/6** each.

Fig. 1052a, for Fig. 1052.
1/6 each.

Fig. 1053a. Key for Figs. 1052/3.
2/- each.

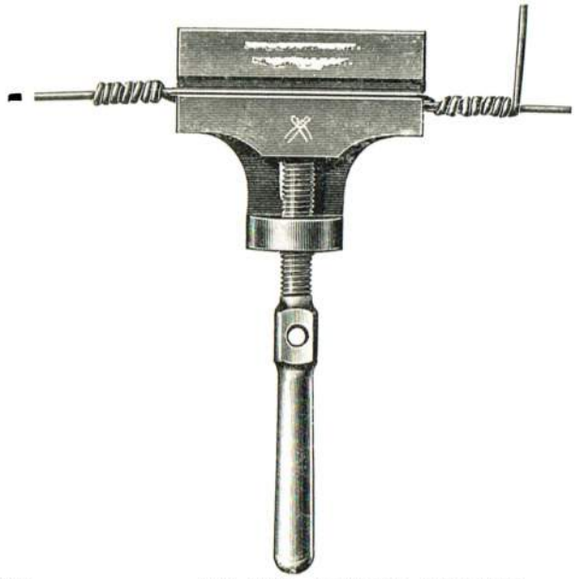

Fig. 1058. Britannia Joint Vice.
Price **12/6** each.

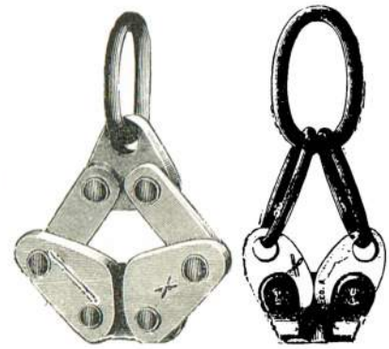

Fig. 1056. **Fig. 1057.**

Draw Tongs.

Price ... ... **5/-** each.

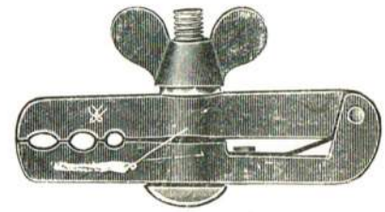

Fig. 1059.
Twisting Clamp for use on Sockets.
Price **3/6** each.

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RATCHET BRACES.

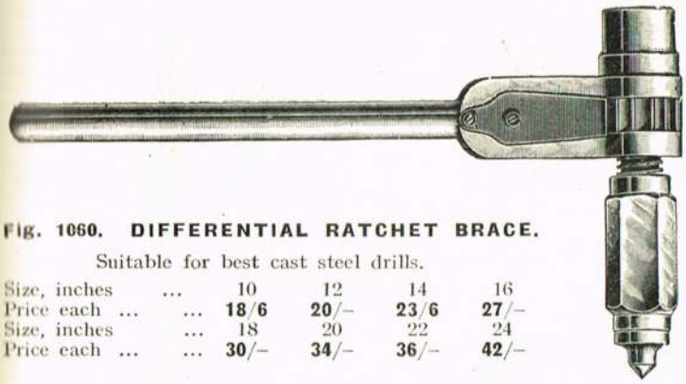


Fig. 1060. DIFFERENTIAL RATCHET BRACE.

Suitable for best cast steel drills.

Size, inches ...	10	12	14	16
Price each	**18/6**	**20/-**	**23/6**	**27/-**
Size, inches ...	18	20	22	24
Price each	**30/-**	**34/-**	**36/-**	**42/-**

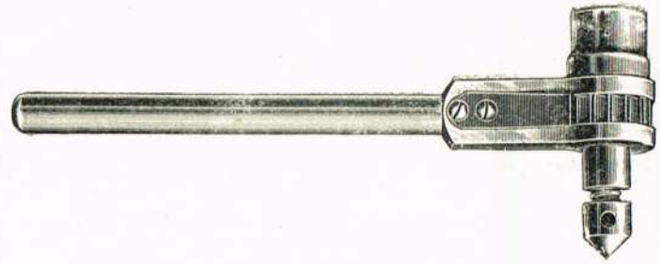


Fig. 1061. ENGINEERS' RATCHET BRACE.

With sockets suitable for twist drills.

Size, inches	10	12	14	16	18	20	22	24
Price each	**18/6**	**20/-**	**23/6**	**27/-**	**30/-**	**34/-**	**36/-**	**42/-**

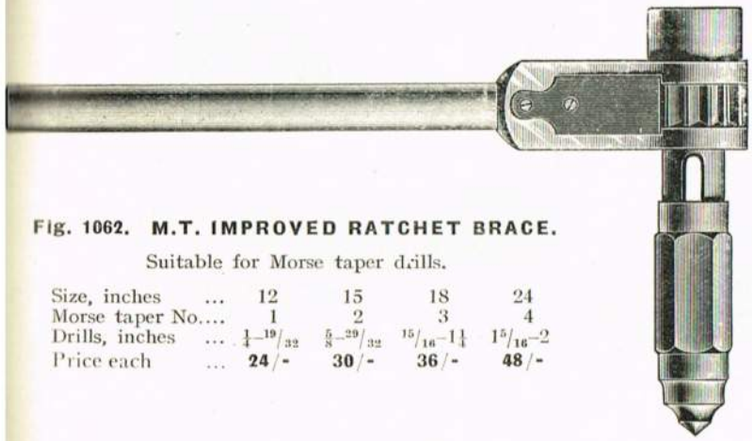


Fig. 1062. M.T. IMPROVED RATCHET BRACE.

Suitable for Morse taper drills.

Size, inches ...	12	15	18	24
Morse taper No....	1	2	3	4
Drills, inches ...	$\frac{1}{4}$–$\frac{19}{32}$	$\frac{5}{8}$–$\frac{29}{32}$	$\frac{15}{16}$–$1\frac{1}{4}$	$1\frac{5}{16}$–2
Price each ...	**24/-**	**30/-**	**36/-**	**48/-**

Fig. 1063. MOTOR RATCHET BRACE.

This ratchet brace is fitted with two centre screws: the shorter leaves the head of brace $2\frac{1}{4}''$ across; the longer increases the head to $3\frac{1}{4}''$ across. The tool is designed for use in cramped spaces, and by use of the longer centre is suitable for all general drilling connected with motor car repairs, etc. The square hole takes cropped Morse bit stock drills.

Price ... **20/-** each.

E350A. Special Drills for same, from $\frac{1}{4}''$—$\frac{3}{4}''$, **12/-** doz.

Fig. 1064. SHORT HEAD RATCHET BRACES.

Size, inches ...	10	12	14
Price each ...	**18/6**	**18/6**	**20/-**

Fig. 1065. WROUGHT STEEL RATCHET BRACE.

For boiler plate work, constructional, etc. For confined spaces. Length 13"; across head $4\frac{1}{2}''$; screw $\frac{5}{8}''$ diameter; adjustable to $1\frac{3}{4}''$; drill hole $\frac{3}{4}''$ square. Price **28/-** each.

Stumpy drills for same, $\frac{1}{4}''$ to $1\frac{1}{4}''$, **24/-** per dozen.

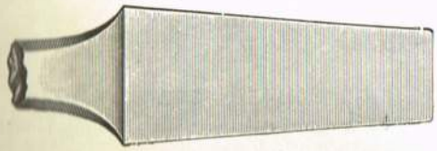
Fig. 1066. ADAPTER for Fig. 1062.

To take square taper shank drills.

Size, Morse taper	1	2	3
Price each ...	**4/6**	**5/-**	**6/-**

Fig. 1068. CAST STEEL DRILLS.

Assorted, $\frac{1}{4}''$—$1\frac{1}{4}''$, **18/-** per dozen.
Larger sizes advance **2/-** per dozen per $\frac{1}{8}''$.



This illustration represents actual size of Fig. 1068 drills suitable for Figs. 1060, 1061, 1062, 1067.

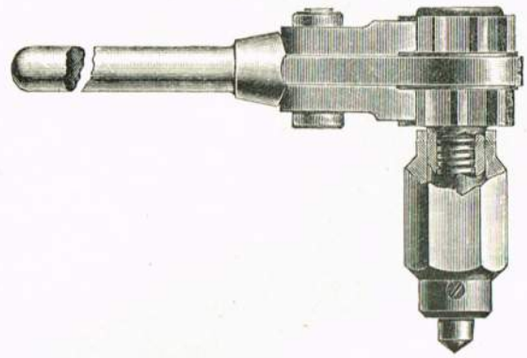


Fig. 1067. NETTLEFOLD'S DIFFERENTIAL RATCHET BRACE.

Size, inches ...	10	12	14	16
Price each	**11/6**	**11/6**	**12/6**	**13/6**
Size, inches ...	18	20	22	24
Price each	**15/-**	**16/-**	**18/6**	**22/-**

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DRILLING PILLARS, Etc.

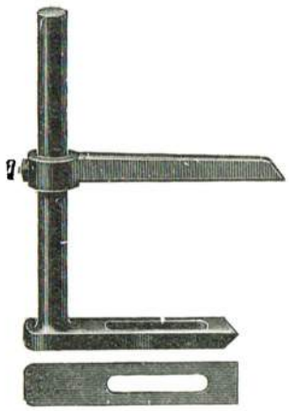

Fig. 1070.

Cast iron arm and feet.
$1\frac{1}{2}''$ diam. × 24″ high.
Price ... **30/–** each.

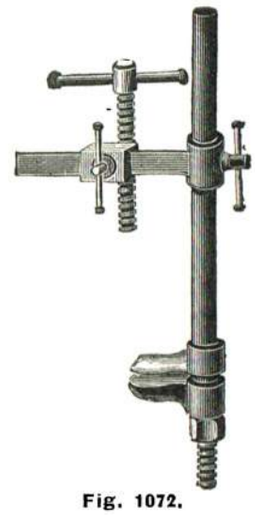

Fig. 1072.
DRILLING PILLAR with Sliding Arm.

Wrough iron pillar and arm.
Cast iron feet and arm box.

Size inches	$20 \times 1\frac{1}{8}$	$22 \times 1\frac{1}{4}$	$24 \times 1\frac{3}{8}$
Price each	**49/-**	**51/-**	**56/-**
Size inches	$26 \times 1\frac{1}{2}$	$28 \times 1\frac{5}{8}$	$30 \times 1\frac{3}{4}$
Price each	**62/-**	**70/-**	**78/-**

Fig. 1071. DRILLING PILLAR. Admiralty Pattern.

For bridge and ship work. Fitted with screw and feather on arm

Size, inches	$16 \times 1\frac{1}{4}$	$18 \times 1\frac{1}{2}$	$21 \times 1\frac{1}{2}$	$24 \times 1\frac{3}{4}$	32×2
Price each...	**26/–**	**32/–**	**35/–**	**50/–**	**70/–**

Fig. 1073. CRANK BRACE. 14/- each.

Fig. 1074. CRANK BRACE. 17/6 each.

Fig. 1075. DRILLING PILLAR with Sliding Arm.

All wrought except the arm box.
£5 5 0 each.

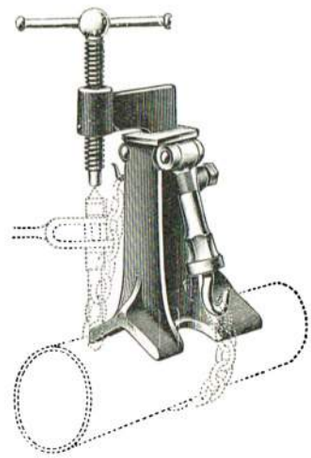

Fig. 1076. PIPE DRILLING STAND.

Cast iron body, steel head, bar and screws. Height from point of screw to pipe, 6″ to 16″.

Price .... **40/9** each.

Extra for iron chain, per foot .... **1/6.**

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RUDGE-WHITWORTH AUTO-PUNCHES & PLIERS.

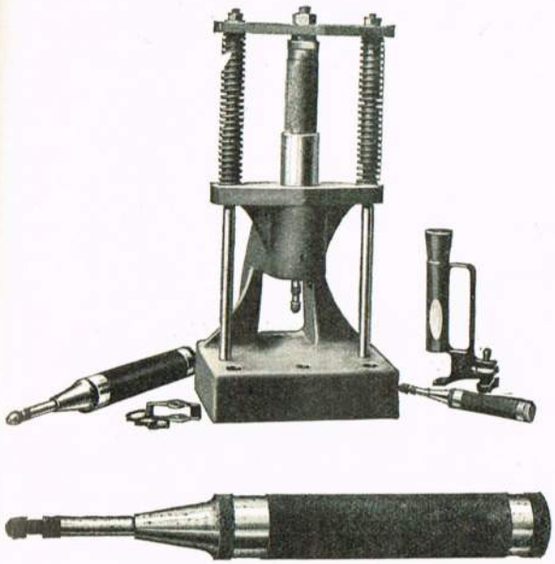

Fig. 1080. AUTO PUNCH.

A portable and handy tool for measuring Brinell hardness.

Two sizes are supplied both of which are hand-operated.

The 12″ Auto Punch delivers a powerful blow to a ¼″ ball making a depression of 3mms. diameter or less according to the hardness of the test piece.

The 6″ is more a laboratory tool and is suitable for thin and soft materials.

The diameter of the depression is read by a microscope.

Some applications of the Auto Punch.

To ascertain the suitability for machining of cast iron, mild, tool, and high-speed steel, castings, stampings, and forgings.

To ascertain suitability for drawing of sheet steel, brass, copper, rolled strip, etc.

To ascertain correctness of heat treatments, Brinell hardness, etc.

PRICES.

Size A	12″ long	£9 0 0
Size B	6″ long	£2 5 0
Leather cases		£0 3 9
Special bench block with V and loading piece		£3 0 0
Graduated collodian with Vee scale		£0 3 0
Special microscope for measuring depressions		£6 10 0
Pocket lens		£0 7 6
Steel balls, ¼″ ... ... per gross		£0 3 9
,, ,, 3/16″ ... ... ,,		£0 2 0

The **Auto Punch** is a hand-operated and portable tool containing a spring-operated hammer, which delivers an adjustable but otherwise constant blow to a ball, forcing same into the article tested to a depth which depends upon its hardness. The depression is not deep enough to damage the article, and the blow can be adjusted so that either the hardened case is tested or both the case and the supporting power of the core.

The diameter of the imprint can be measured by a microscope or transparent Vee scale.

Originally devised for testing case-hardened articles, the Auto Punch has proved itself extremely useful for testing the hardness of materials of all sorts, heat-treated and otherwise.

For instance, the proportion of machined articles produced in a certain shop that were rejected for being wrong to gauge fell at once to an insignificant figure when the bars were Auto-punched and graded as to hardness before they were issued for machining. At the same time tool breakages became less frequent, and the output noticeably increased.

In another case a manufacturer, having trouble with the variable hardness of rolled brass strip, put a Rudge-Whitworth Auto Punch into use for testing the product from each of his annealing furnaces.

It was soon discovered that certain furnaces were giving under-annealed work (Auto Punch depression smaller than on material from other furnaces), and further investigation showed that the pyrometers in these furnaces were giving incorrect figures. After these had been corrected the trouble ceased.

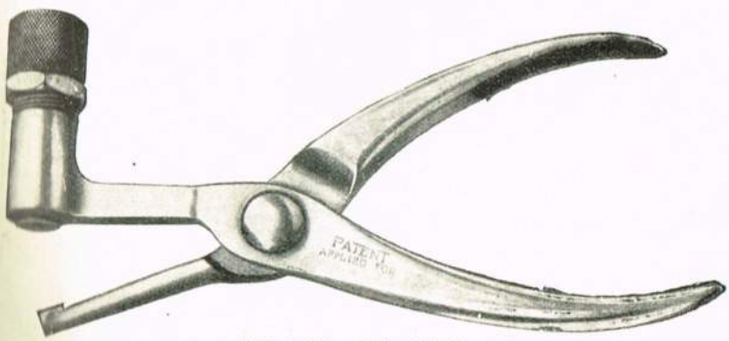

Fig. 1081. Brinell Pliers.

Fig. 1081. BRINELL PLIERS.

The **Brinell Plier** was evolved to provide a simple and effective means of ascertaining the Brinell hardness of very thin materials, *e.g.*, cartridge cases.

In form it resembles a pair of pliers. The specimen is placed between the jaws, one of which carries a ball 3/64″ diameter. The pressure between the ball and the specimen is about 20 lbs., and is determined by a spring carried behind the ball.

A depression of about ½ mm. diameter is produced.

Applications.—To ascertain the correctness of heat treatments, Brinell hardness, etc., of very thin rolled or drawn materials of all kinds.

Price £10 10 0

Fig. 1082. STANDARD BALL GAUGES.

Hardened steel balls, made as accurately and as perfectly as is humanly possible, equal to the finest products of the optician's art. Can be used for checking micrometers.

Sizes 6″ to ½″	... ... Price, with dimensions certificate	5/–
,, ½″ to 1″	... ... ,, ,, ,, ,,	7/6
,, 1″ to 1¼″	... ... ,, ,, ,, ,,	10/–

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MILLERS FALLS HAND DRILLS.

Fig. M. F 930 This drill is identical with No. 1980 except that it does not have the ratchet action.

The convenience of the speed shifter on both of these drills will be particularly appreciated when it is necessary to slow up quickly from high speed. A half turn on the knurled barrel changes the speed within a fractional part of a revolution and without removing the drill from the work.

Capacity 0-⅜in. Price each without points, **13/5** each.

No. 1980. As above but with Ratchet **13/5** each.

ig. M.F. 2 A strong, serviceable tool. The flat end on main andle rests comfortably against the body for hard drilling.

Chuck—three jaw. Protected springs. Capacity 0-⅜in., round hank drills.

Single speed. Ball thrust bearing.

Adjustable friction roll to equalize bearings.

Hollow end main handle of cocobola containing eight wood oring points.

Price each (including points), **10/5.**

g. M.F. 7 Differs from our other large drills mainly because it s solid steel frame.

'huck—three jaw. Protected springs. Capacity 0-⅜in., round anks.

Single speed. Idler pinion to equalize bearings.

Handles stained hardwood. Main handle solid, side handle achable.

Price each (without points), **9/1.**

M.F. 1 Malleable iron frame, japanned chuck, with capacity of It is an easy running, exceptionally serviceable drill.

Price each (including points), **8/1.**

M.F. 3 With steel frame, main handle. Is detachable and its packing the complete drill in a very small space. Drills o the capacity of the chuck may be carried in the handle. chuck.

Price each (without points), **8/7.**

ill Bits, in 8 sizes, **1/1** per doz.

Fig. M.F. 5. The two chief features of this drill are the wide rim on the large gear which can be firmly held between the thumb and finger tips in doing delicate work, and the double pinions which make it exceptionally smooth in action. It is our most popular small hand drill.

Chuck—three, jaw, springless. Capacity 0-⅜in. round shank drills.

Single speed. Ball thrust bearing.

Double pinion, including idler pinion to equalize the bearings.

Hollow end main handle of cocobola, containing eight wood boring points.

Price each (with points), **9/3.**

Fig. M.F. 15. Identical with No. 5 except that the main handle is solid, of stained hardwood, and no drill points are furnished.

Price each, **9/3.**

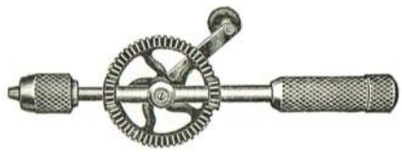

Fig. M.F. 343 A comparatively new style of drill. Neat, compact in construction and combines beauty of appearance with serviceability. It is all metal and practically unbreakable.

Chuck—three jaw. Springless. Capacity 0-⅜in. round shank drills.

Single speed. Solid steel frame—nickeled.

Main handle—hollow steel, enameled bright black.

Price each (without points), **8/6.**

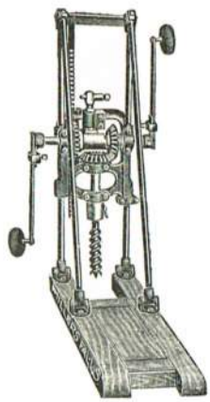

Fig. M.F. 145. Boring Machine.

Bores vertically or at any angle within an arc of 50 degrees.

Frame locks automatically at topmost point—released by thumb latch.

Raises automatically by turning handles as in boring.

Adjustable cranks regulate speed and power.

Boring depth 12 inches. Made to order for greater depths.

Spindle cranks, uprights and angle rods of steel. Wood bottom board.

Steel and machined parts polished, other metal parts japanned.

Handles stained hardwood.

Price (without augers), **£2/3/8.**

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BRACES.

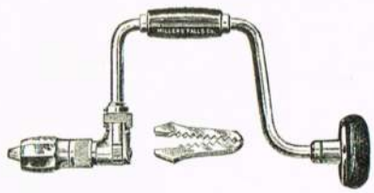

Fig. M.F. 162/3. Brace with Steel Chuck.

Cast jaws. With exposed metal parts polished instead of nickel-plated.

Nos.	162	163
Sweep	10″	8″
Price each	**4/11**	**4/9**

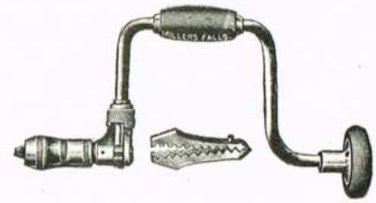

Fig. M.F. 321/3.

Stained hardwood head and handles. Exposed metal parts polished and nickel-plated.

Chuck—Barber, with forged alligator jaws. Ratchet—open.

Handle—inserted metal rings. Head—ball-bearing.

Nos.	321	322	323
Sweep	12″	10″	8″
Price each	**9/–**	**8/9**	**8/6**

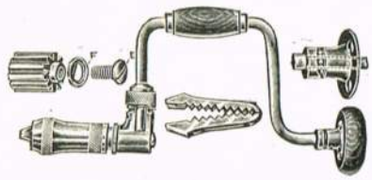

Fig. M.F. 31/3.

Cocobolo head and handle. Exposed metal parts nickel plated and buffed.

Chuck—Barber with forged steel alligator jaws. Holds bit shanks only.

Ratchet—Boxed. Head—Ball-bearing. Steel quill.

Handle—Inserted metal rings.

Nos.	31	32	33
Sweep	12″	10″	8″
Price each...	**10/11**	**10/7**	**10/3**

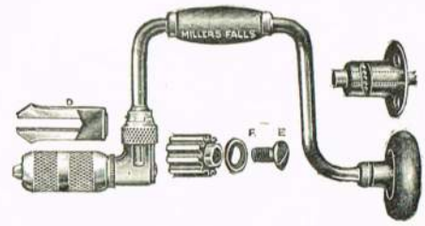

Fig. M.F. 730/3. The "Holdall" Brace.

This name has reference to the chuck which holds bit shanks round from $\frac{1}{8}$″ to $\frac{1}{2}$″ and No. 1 Morse taper shanks.

Cocobolo head and handle. Exposed metal parts nickel-plated and buffed.

Chuck—Master. Jaws have parallel milled grooves which grip along their entire length.

Ratchet—Boxed. Head-ball-bearing.

Handle—inserted metal rings.

Nos.	730	731	732	733
Sweep	14″	12″	10″	8″
Price each...	**12/4**	**11/11**	**11/7**	**11/3**

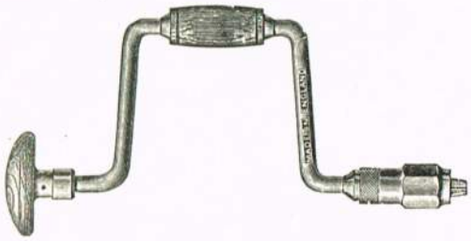

Fig. 1091. Plain Braces.

Light but strong.

Alligator cast jaws. Steel chuck. Plain bearings. Stained wood. Polished metal parts.

No. 142. 10″ ... ... **2/6** each.
No. 143. 8″ ... ... **2/5** each

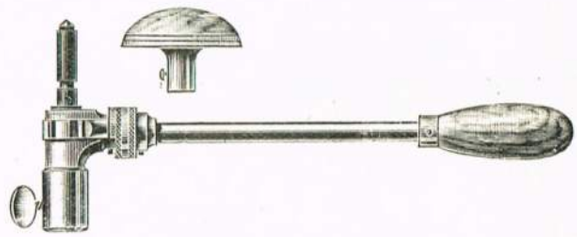

Fig. 1092. Hand Ratchet Brace.

10″ long. Bright.
Per dozen ... **60/–**.

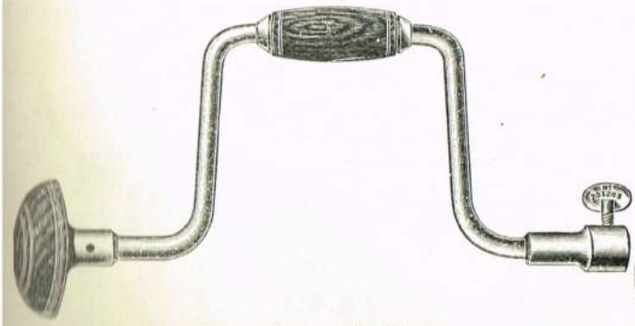

Fig. 1093. Plain Brace.

With thumb screw, for square shank bits. 9″ sweep.
Price ... **19/–** per doz.

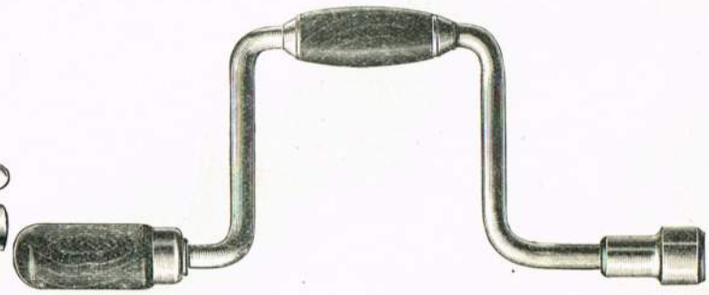

Fig. 1094. Spanner Brace.

For detachable motor car wheels. 9″ sweep.
To take nuts $^{5}/_{16}$″ to $\frac{1}{2}$″. Brghit. **23/–** per dozen.

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MILLERS FALLS BREAST DRILLS.

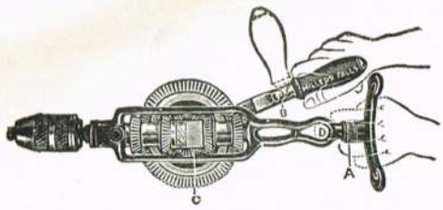

Fig. M.F. 97. Ratchet Breast Drill.

It will reach places inaccessible with the ordinary breast drill. Turning the knurled sleeve (Fig. C.) operates the ratchet; pressing the knob on crank handle changes the speed instantly without removing drill from the work. No simpler operations can be conceived.

Five ratchet actions—

1. Neutral position, which gives the drill the ordinary direct drive without ratchet action in both fast and slow speeds.
2. Ordinary right-hand ratchet action in which the chuck stops turning on backward stroke of the crank.
3. Ordinary left-hand ratchet action.
4. Continuous right-hand ratchet action in which the chuck turns continuously to the right on both forward and backward strokes of the crank.
5. Continuous left-hand ratchet action.

Fast and slow speeds separated by bushings, friction greatly reduced.

Crank handle adjustable for use as ordinary crank or as straight lever for ratchet action.

Breast plate has hand-hold for steadying tool.

Take up nut to overcome any wear in ball bearings.

Double gear drive.

Chuck—3 jaw. Protected springs. Capacity 0-½in. round shanks.

Speeds—two. Gear ratios even and 2¾ to 1.

Frame—malleable iron enameled black.

Ball thrust bearing.

Length 17½ inches. Weight each 8¼lbs. Price each, **28/1.**

Fig. M.F. 118.

Chuck—3 jaw. Protected springs. Capacity 0-½in. round shanks.

Speed—two. Gear ratios even and 3 to 1. Changed by removing set screw and shifting large gear.

Annular ball bearing spindle, as well as ball thrust bearing, with take up net to provide for wear.

Crank handle extensible. 4 to 6 inch radius.

Idler roll to equalize bearing. Adjustable breastplate.

Level attached.

Length 17½ inches. Weight each, 6½lbs. Price each, **15/9.**

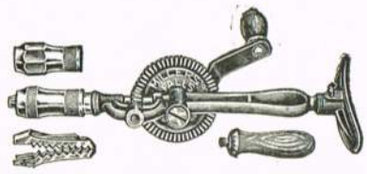

Fig. M.F. 112.

An ideal drill for light work. It is built primarily or those who have but occasional use for a breast drill. Single peed, with 2 jaw chuck for square shank drills.

Length 15 inches. Weight each, 4lbs. Price 8/6.

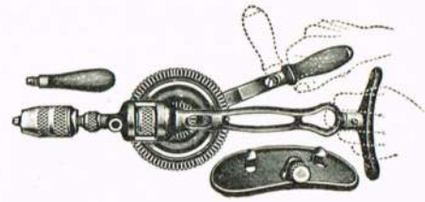

Fig. M.F. 200. Ratchet Breast Drill

Ratchet Breast Drill has a plain left and right hand ratchet. It is simple in design, yet thoroughly practical.

Slightly rotating the knurled ring changes the speed instantly at any point, and without removing drill from the work. A turn of the boss on crank handle operates the ratchet.

Crank handle usable in regular way or can be turned to straight lever for greater power.

Auxiliary breastplate for comfort and power in doing heavy work.

Chuck—3 jaw. Protected springs. Capacity 0-½inch round shanks.

Speeds—two. Gear ratios even and 3 to 1.

Ball thrust bearing.

Frame—malleable iron enameled black.

Length 18 inches. Weight each, 7lbs. Price each,

Fig. M.F. 2100.

The speeds can be instantly changed by actuating knurled nut. Gear ratios 3 to 1. 3 jaw chuck. Capacity 0-½in. Springs protected.

Length 17½ inches. Weight each, 5¾lbs. Price each **13/1.**

Fig. M.F. 99.

Changeable gears by knurled nut. Gear ratio 3 to 1. 2 jaw chuck with capacity for all drills to ½in.

Length 18 inches. Weight each, 7lbs. Price each, **13/1.**

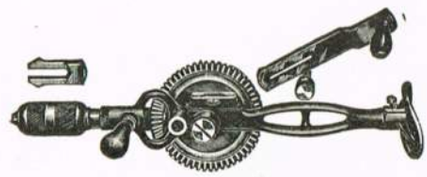

Fig. M.F. 12.

Same as M.F. 118, but fitted with master chuck for all drills ⅛in. to ½in.

Length 17½ inches. Weight each, 6½lbs. Price each, **17/4.**

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BENCH AND CHAIN DRILLS.

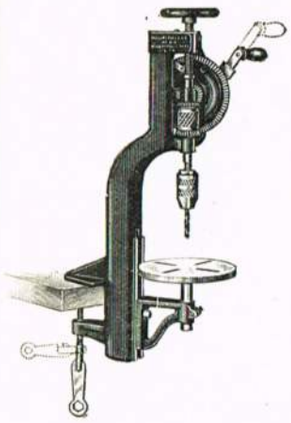


Fig. M.F.216. BENCH DRILL.

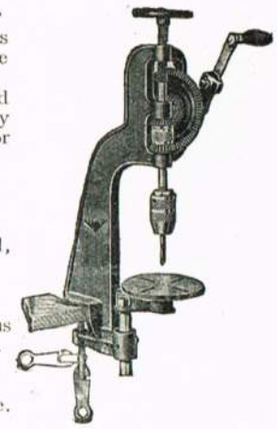
The distinguishing feature is the feed construction. Two rates of automatic feed positive in action are insurance against drills breaking when about to go through the work, or when used on thin material. Also it gives the operator free use of one hand to hold the work. Drill can be fed by hand if desired, by means of feed wheel conveniently located at top.

Three frame bearings hold the drill spindle and feed screw making it unusually strong and rigid.

Specifications.

Two speeds, ratios even and 3½ to 1.
Instantly changed by turning knurled sleeve. Cut gears.
Pinions of steel. Ball thrust bearings.
Crank handle extensible, 3″ to 6½″ radius.
Chuck—three-jaw, protected springs. Capacity 0 to ½″ round shanks.
Table 7½″ in diameter slotted to receive vice clamps or posts to hold work in place. Steel feed screw, spindle and chuck.
Cast iron frame, large gear and table.
Chuck and knurled sleeve nickeled. Frame enamelled black.
Large gear enamelled red. Other machined parts polished.
Traverse of automatic feed 2⅛″. Distance from table to chuck 8″.
Vertical adjustment of table bracket 5¾″.
Vertical adjustment of table in its bracket 2½″.
Height above bench 22″. Height overall 28″.
Weight boxed 50lbs., nett 30 lbs. Price each **£2 17 1.**

Fig. M.F.210. BENCH DRILL.



A bench drill with hand feed is adequate, unless there is a large amount of drilling to be done.

No. 210 is a rigid, strongly built, and accurate drill. It is thoroughly efficient and an exceptional value for the price.

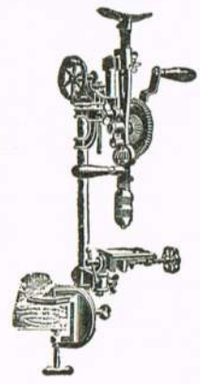
Specifications.

Feed. Hand wheel conveniently located at top.
Two speeds, ratio 1½ to 1 and 4 to 1, instantly changed by turning knurled sleeve.
Cut gears. Pinions of steel.
Crank handle extensible, 3″ to 6″ radius
Chuck—three-jaw, protected springs.
Capacity 0 to ½″ round shanks.
Steel feed screw, spindle and chuck.
Cast iron frame, large gear and table.
Chuck and knurled sleeve nickeled.
Large gear enamelled red. Frame enamelled black.
Table and other machined parts polished.
Maximum distance from chuck to table 9″. Height overall 24″.
Weight boxed 27½lbs., nett 22lbs. Price each **£1 16 3.**

Fig. M.F.20. BENCH DRILL.

This tool is of particular value when the use of a bench drill is secondary to that of a breast drill. With this standard breast drills (see note below) can be made to serve a double purpose.

The drill is easy to attach, can be swivelled into many positions and clamped at varying heights either above or below the bench.



The vice is swung on a pin off centre, and can be used in any position, or at any angle with the frame, vertical to horizontal, or completely reversed and the table turned uppermost.

It is thoroughly practical and makes an efficient bench drill. Note—Can be used with any Millers Fall breast drill except Nos. 13, 19, 29, 112, 212 or 293.

Specification.

Feed. Governed by hand wheel, conveniently located at top.
Rapid action. Steel feed gears and post.
Post and machined parts polished.
Other metal parts japanned.
Height of standard 24″.
Weight boxed 28lbs., nett 19lbs.
Price without breast drill, **25/8** each.

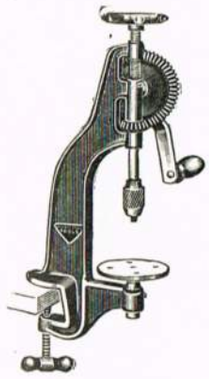


Fig. M.F.207. BENCH DRILL.

This drill is built along simple lines, and is an ideal tool for light work. It is neat, clean cut and thoroughly well made.

Specifications.

Feed—hand wheel at top of frame.
One speed, ratio 3 to 1.
Chuck—3-jaw, protected springs.
Capacity 0–¼″ round shanks.
Cut gears. Steel pinion.
Frame—malleable iron, enamelled black.
Feed wheel and large gear enamelled red.
Chuck, nickeled.
Maximum distance from chuck to table 4½″.
Height overall, 18″.
Weight 8½lbs. nett, 13lbs. gross.
Price .... **19/2.**

Fig. M.F.22. BENCH DRILLS.

The purpose of this tool is to convert a hand drill into a small bench drill for wood or metal drilling. The hand drill is easily inserted and firmly held by an adjustable clamp. Drill can be fed as rapidly or as slowly as desired by means of sensitive compound lever. It is well made and makes a convenient and effective tool.

Holds the following Millers Falls hand drills: Nos. 1, 01, 2, 2B, 5 05 and 105.

Will hold No. 980 and 1980 by using special clamp, costing **9d.** each.

Specifications.

Height of standard above bench 15½″.
Grey iron frame, enamelled black. Steel standard.
Steel lever—polished.
Weight 8lbs.
Price without drill, **11/1** each.

Fig. M.F.719. CHAIN DRILLS.

The same construction as No. 717, except is furnished with Millers Falls chuck.

Chuck—3-jaw, protected springs.
Capacity 0–½″ round shanks.
Ball thrust bearing.
Frame, malleable iron, japanned black.
Chuck polished.
Length with chuck, 11¾″. Weight 4½lbs.
Price .... **15/8** each.

Fig. M.F.718. CHAIN DRILL.

Identical with No. 717 except has master two-jaw chuck which holds bit, round from ⅛″ to ½″ and No. 1 Morse taper shanks.

Length of chuck, 11½″.
Weight 4½lbs.
Price .... **13/4** each.

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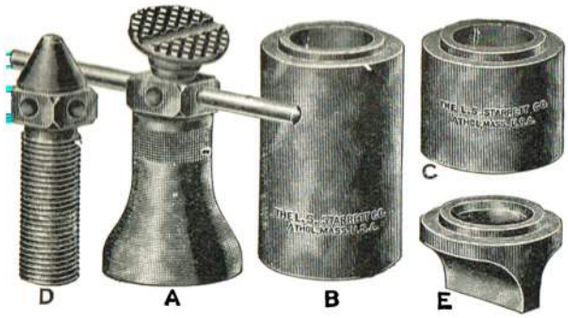
JACKS AND CLAMPS.



PRICES.
(For either the No. 190 or No. 191.)

Jack (A)	...	**3/9**
Extension base (B)	...	**1/3**
Extension base (C)	...	**1/–**
Extension base (E)	...	**1/–**
Extra screw (D)	...	**1/–**
Jack, with all attachments		**7/3**

Fig. 1096. (Nos. 190 and 191). STARRETT "LITTLE GIANT" JACKS.

These are designed for tool-room use, for levelling up work on a planer-bed or under upright drill, setting up machinery, etc. All parts are case-hardened.

No. 190. The Jack (A) is $1\frac{1}{4}''$ diameter at the base and has a range from $2\frac{1}{4}''$ to $3\frac{5}{8}''$. will raise 1,000 lbs. or more. Two extension bases (B and C) are made to fit the base of : main part (A) and are 2″ and 1″ high respectively. With these two extensions used gly or together a reach from $2\frac{1}{4}''$ to $6\frac{1}{2}''$ may be obtained.

An auxiliary pointed screw (D) is supplied to be used in place of screw with swivel cap in tain places where it may be preferable. Very often at the point where the jack screw ıst be placed base (B) cannot be used. For use in such instances the base (E) is provided.

No. 191A. A smaller size is made, 1″ diameter. Part A, $1\frac{1}{2}''$ high ; B, 1″, and C, $\frac{1}{2}''$. th this size, adjustments from $1\frac{1}{2}''$ to $3\frac{1}{2}''$ are obtainable.

Fig. 1097.

ARMSTRONG PLANER JACKS.

No.	Height inches	Weight lbs.	Price each
1	$2\frac{3}{4}$—$3\frac{3}{4}$	$1\frac{1}{2}$	**5/3**
2	$3\frac{3}{4}$—$5\frac{1}{4}$	3	**8/4**
3	$5\frac{1}{4}$—$7\frac{1}{2}$	6	**12/6**
4	$7\frac{1}{2}$—12	12	**24/–**

ig. 1098. (No. 154). STARRETT ADJUSTABLE PARALLELS.

hese parallels will be found very convenient for use in connection with ing, planer and shaper vices, taking the place of the large number usually ired, also for levelling up work on a planer, drill press, etc. They will be d valuable as a support for grinding or milling of square or hexagonal on centres, as they may be adjusted and locked to micrometer surement sfrom $\frac{3}{8}''$ to $2\frac{1}{4}''$.

).	Length	Thickness	Capacity	Price
A	$1\frac{3}{4}''$	$^9/_{32}''$	From $\frac{3}{8}''$ to $\frac{1}{2}''$	**3/9**
B	$2\frac{1}{8}''$	$^9/_{32}''$	,, $\frac{1}{2}''$ to $^{11}/_{16}''$	**4/9**
C	$2^{11}/_{16}''$	$^9/_{32}''$	,, $^{11}/_{16}''$ to $^{15}/_{16}''$	**5/–**
D	$3^9/_{16}''$	$^9/_{32}''$	,, $^{15}/_{16}''$ to $1^5/_{16}''$	**6/3**
E	$4^3/_{16}''$	$^9/_{32}''$	,, $1^5/_{16}''$ to $1\frac{3}{4}''$	**7/6**
F	$5^1/_{16}''$	$^9/_{32}''$	,, $1\frac{3}{4}''$ to $2\frac{1}{4}''$	**8/9**

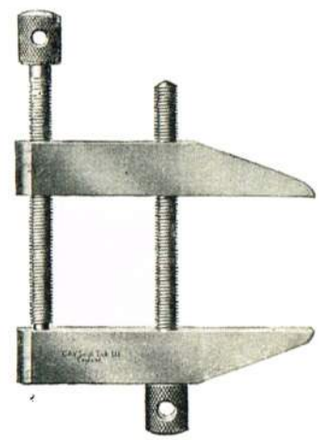


Fig. 1099.

Made of high-grade, mild steel. Case-hardened.
Are efficient and durable tool-makers' clamps.

No.	Length of jaws inches	Capacity inches	Price per pair Two clamps
A	$1\frac{5}{8}$	$\frac{3}{4}$	**5/5**
B	2	$1\frac{1}{4}$	**6/6**
C	$2\frac{1}{2}$	$1\frac{3}{4}$	**7/8**
D	3	$2\frac{1}{4}$	**9/–**
E	4	$2\frac{3}{4}$	**9/11**

Fig. 1100. (Nos. 301/4). "VULCAN" MACHINISTS' CLAMPS.

These clamps are drop-forged from a strong, tough steel, and are subjected to a special process which increases their strength and reduces the liability of springing.

When ordering extra screws, specify whether for end or centre ; lengths given are under-head dimensions.

Each clamp is packed in a box for convenient shelving. Mounted on board for shop use in sets of 4 (1 of each size) if specified.

Size	Capacity Maximum opening	Capacity Length jaw from screw	Screws—Hardened and tempered End Diameter	End Length	Centre Diameter	Centre Length	Price complete clamp
301	$1\frac{1}{4}$	$1\frac{3}{4}$	$^5/_{16}$	$2\frac{5}{8}$	$^5/_{16}$	$2\frac{5}{8}$	**6/3**
302	$2\frac{1}{4}$	$2\frac{1}{4}$	$\frac{3}{8}$	$3\frac{1}{4}$	$\frac{3}{8}$	$3^{15}/_{16}$	**8/4**
303	$3\frac{1}{4}$	$2\frac{3}{4}$	$^7/_{16}$	$4\frac{5}{8}$	$^7/_{16}$	$5\frac{1}{4}$	**10/5**
304	$4\frac{1}{4}$	$3\frac{1}{4}$	$\frac{1}{2}$	$5\frac{3}{4}$	$\frac{1}{2}$	$6\frac{1}{2}$	**12/6**

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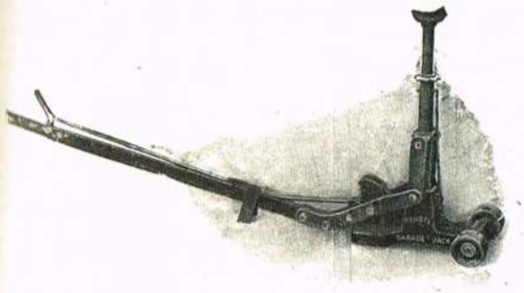
JACKS.



View showing both adjusting racks and the lifting rack run out to the full extent.

Fig. 1101. THE TANGYE GARAGE JACK.

This Jack has been designed expressly for use in the garage, for lifting cars for washing purposes, changing wheels or tyres, repairs and general service.

It is provided with two sliding racks operated independently of each other, and with adjustments to suit different heights of axles, the load being lifted direct at one stroke by means of the lever, and maintained in position as long as may be required.

The Jack is of substantial design and construction, and being made of best quality material and workmanship, is practically unbreakable. It is mounted on two rollers for easy transport. The Jack is of ample strength for dealing with the usual work of a garage, including heavy touring cars, etc.

Height when down	8 ins.
Run-out of each rack	4½ ,,
Direct lift from lever	4 ,,
Height with full run-out	21 ,,
Approx. weight	34 lbs.
Price	**65**/–

Fig. 1102. Patent Motor Car Jack.

For cars weighing up to 35 cwts., with automatic sliding worm, quickly raised and lowered.

Size No.	Height when down Ins.	Maximum run out Ins.	Approx. weight of jack lbs.	Price including lever
1	7¼	4	6	**18**/–
02	8¾	4½	7¼	**18**/–
2	9½	4½	7¼	**18/6**
2A	10½	4½	7½	**18/6**
3	11¼	6	8	**20/6**
3A	12¼	6	8¼	**20/6**

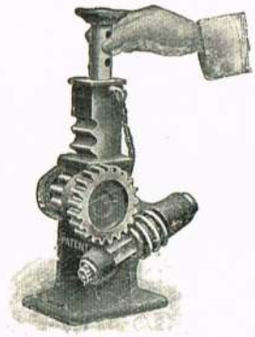
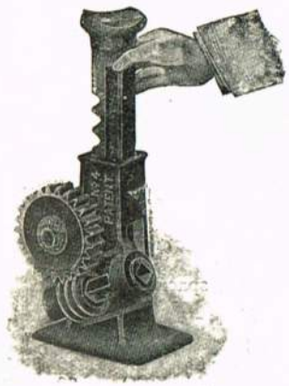


Fig. 1103. "D.L." Motor Jack.

In addition to the rotary sliding worm this model has a quick-lift sliding top, held in position by a set pin.

Nos. 1, 2 and 3 are for 35 cwt. vehicles.
No. 4 is for 60 cwt. vehicles.

Size No.	1	2	3	4
Height when down	6″	7¼″	8½″	7½″
Run-out of top rack	4″	4¾″	5¼″	4¾″
,, bottom rack	3½″	4½″	4½″	4½″
Total run-out	7½″	9¼″	10″	9¼″
Height with full run-out	13½″	16½″	18½″	16¾″
Approx. weight, lbs.	8¼	9	9¾	15¾
Price (including hand lever)	**21**/–	**21**/–	**22**/–	**36**/–



Rack being lifted to the axle at one stroke.

Fig. 1104. PATENT QUICK-LIFT JACK.

The design of this Jack is on similar lines to that of the well-known Tangye Motor Car Jack, but is of a much heavier pattern for motor lorries, vans and commercial motor vehicles.

It is by far the most convenient and handy form of jack for its purpose which has yet been introduced, and much more accessible to work than the old screw jack with a tommy bar, necessitating the user's getting almost underneath the axle to work it. Its construction is so simple that it is impossible to get out of order. With this new jack, the full load may be easily lifted by one man standing alongside the vehicle. The rack can be instantly lifted to its work, and instantly lowered after use. There is absolutely no internal mechanism. It is strongly made in malleable steely mixture, and is practically unbreakable.

Nos. 3B and 3C are suitable for commercial vehicles, delivery vans, light lorries, etc., weighing up to about 3 tons.

Nos. 4 and 4A are designed for motor 'buses, and similar heavy vehicles weighing up to about 6 tons.

Size No.	Height when down inches	Maximum run out inches	Approx. weight of jack lbs.	Price including lever.
3B	12	5½	18	**32**/–
3C	13	5½	18½	**32**/–
4	12	5½	30	**54**/–
4A	13	5½	30½	**54**/–

Fig. 1105.

Fig. 1105. "LI-CAR" JACK, for light cars and taxis. The driven gear can be lifted off the driving gear for quick adjustment.

Size No.	Height when down ins.	Run-out ins.	Size of base ins.	Approx. weight of jack lbs.	Price including lever
1	7¾	4	4½×3¼	4¼	**7/3**
2	9	5	4½×3¼	4½	**7/3**

Fig. 1106. Type "R.L." JACK. For Ford Cars. Body of rectangular section with reversible pawl for raising or lowering the jack.

Height when down	9¾ ins.	Approx. weight	4 lbs.
Run-out	5¾ lbs.	Price	**6**/–

Fig. 1106.

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JACKS: Industrial and Motor.

Fig. 1107. Nos. 22 and 29.

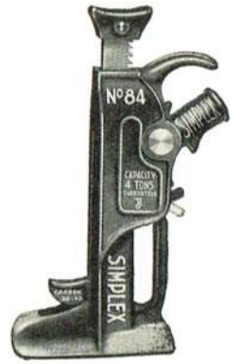

Fig. 1108. No. 24.

Fig. 1109. Nos. 85 and 86.

Fig. 1110. Nos. 55 and 56.

These Jacks are expressly made for railway, tramway, road transport and general industrial purposes. Made of best malleable iron. The bearings of hardened steel, and all other working parts of heavy drop-forged steel.

No.	22	24	29	85	86	55	56
Capacity, tons	10	15	15	5	5	5	7½
Height, inches	21¼	23	28	17	20¼	17	17
Lift, inches	12	13	18	10½	13¼	10½	8¾
Weight, lbs.	58	87	110	28	34	49	44
Price each ...	**£9 4 11**	**£14 1 2**	**£14 18 11**	**£5 19 3**	**£6 17 7**	**£9 2 8**	**£9 4 11**

PRICES FOR EITHER PATTERN.

Size to lift tons ...	½	1	1½	2	3	4	5	6	8	10
Height when down inches	6	9	12	15	16½	18	21	24	24	24
Weight, lbs. ...	6	11½	14½	19	24½	27½	39	51	59	65
Price each ...	**9/8**	**11/-**	**12/9**	**17/-**	**18/10**	**22/-**	**27/-**	**31/9**	**37/9**	**47/9**

If supplied with Round Steel Lever—Extra
½ to 1½ tons, **1/-** each. 2 to 5 tons, **1/2** each. 6 to 10 tons, **2/-** each.

Fig. 111. Screw Jack.
Cast iron with mild steel screw.

Fig. 1112. Screw Jack.
with U top, mild steel screw.

Fig. 1113.
EXTRA STRONG SHORT-LIFT FITTERS' JACK.

Malleable iron body and head, fitted with mild steel set screw.

Tested to ... 20 tons
Height when down 9″
Weight ... 16 lbs.
Diam. of screw 2″
Price each ... **26/6**

Fig. 1114.
SHORT LIFT JACK.
With mild steel screw for cramped spaces.

Size to lift tons	2	3	4	5	6	8	10
Height when down inches	7	7½	8	8½	9	10	10
Weight, lbs. ...	7	9	11¼	14	15½	20	25
Price each	**12/4**	**12/6**	**15/-**	**15/9**	**18/9**	**22/6**	**26/-**

Fig. 1115.
THE "MOJACK" OWNER DRIVERS' JACK.

Simple and efficient. Embodying the safest principles in jack construction, combined with extreme care in manufacture. All moving parts made of selected steel. The body of high-grade iron. Constructed in two grades, with and without roller bearings. Price includes handle.

Without ball bearings.				With ball bearings.			
No.	Height	Lift	Prices	No.	Height	Lift	Prices
1	7¼″	4″	**14/6**	4	7¼″	4″	**17/-**
2	8¼″	5″	**15/-**	5	8½″	5″	**17/6**
3	9½″	5″	**16/-**	6	9½″	5″	**18/-**
				7	11½″	5½″	**21/-**

All the above models are strong enough to lift any car on the road, but for cars over 20 cwts. those with roller bearings will be found easier in use. Guaranteed against any defect without time limit.

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MOTOR CAR AND INDUSTRIAL JACKS.

SIMPLEX JACKS.

These lifting jacks are constructed upon up-to-date principles, giving greater efficiency than is usual in most types. They will be found to work greater loads with very little exertion. Manufactured from the finest materials, the body being of malleable iron. Drop-forged lever socket, detachable shoe, rack bar and pawls. The bushings and lever bar of steel. The system of pawls, locked at all points of the stroke, renders it impossible to drop the load under any circumstances.

Fig. 1116. (Nos. 36 and 38).

Fig. 1117. (No. 41).

Fig. 1118. (No. 42).

Fig. 1119. (Nos. 43 and 44).

No.	36	38	41	42	43	44
Capacity, tons	¾	1	1½	2	3	4
Lift, inches	6½	6	7	8½	10	9
Height, inches	10	10½	10	11½	13	13¼
Weight boxed, lbs.	5	7	4½	11	13	20
Price	**16/8**	**22/–**	**35/–**	**45/–**	**50/–**	**55/6**

HEAVY DUTY JACKS.

Complete with 3 ft. Detachable Tubular Lever.

This tool has been specially designed and patented to meet the demand for a lifting jack which, while having a minimum height when down, will give an extensive lifting range.

The principle of construction is that of a right and left hand screw, the body being revolved by means of a ratchet simultaneously operating upon and raising or lowering both screws.

The ratchet is fitted with one clutch only, which is reversible for raising or lowering.

The screws are fitted with stops which prevent them working out when raised to their fullest extent.

The tool is accurately and substantially made, and is capable of the most speedy and simple handling.

One of the principal features of this tool is that the cap adjusts itself to any unevenness of the ground or work to be raised, to the extent of 1½″ to the foot, thus ensuring the weight being dead central, and also preventing any skidding of the jack when in use, which is a distinct advantage not possessed by jacks fitted with the ordinary revolving cap.

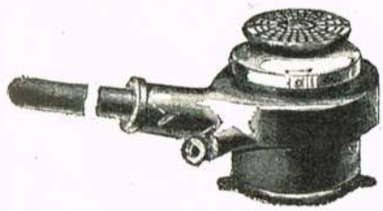


Fig. 1120/1. Closed.

The three screw holes on the base of the jack serve to attach it to the traversing base ; also where the jack has the necessary lifting range but is not high enough, when down, to reach the object to be lifted, a wood base or block can be attached to raise it to the height required.

The top screw is capable of being raised or adjusted to the object to be lifted to the extent given below.

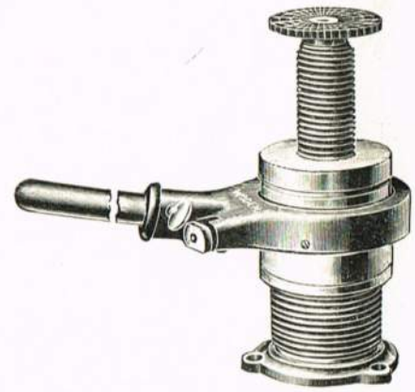
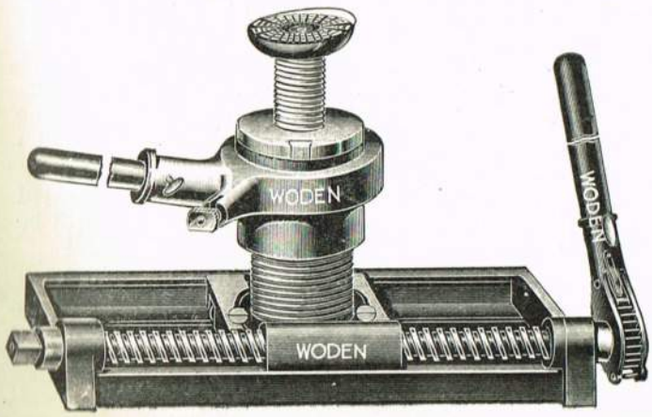


Fig. 1120/1. Open.

Size	Height when down.	Extent of adjustment of top screw by hand.	Height when fully raised.	Lifting range.	Approximate weight.	Price each.
A	5¼″	1″	11¾″	6½″	26 lbs.	**£4 19 6**
B	8¼″	1¾″	20″	10″	36 lbs.	**£6 3 9**



As used with Traversing Base.

HEAVY DUTY JACKS FITTED TO TRAVERSING BAR. Fig. 1122.

This traversing base, which is made of best malleable iron, is fitted with a steel screw working the saddle to which the jack is attached, the saddle moving on steel rollers. The screw is worked by a detachable and reversible ratchet lever.

The length of traverse is 12″ clear, and raises the height of the No. 1 or No. 2 jack 1½″.

Approximate weight of base, 56 lbs.

C Price of base complete, with rachet and lever **£4 18 3**

D Price of base and lever, fitted with No. 1 jack **£9 17 9**

E Price of base and lever, fitted with No. 2 jack **£11 2 0**

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JACKS.

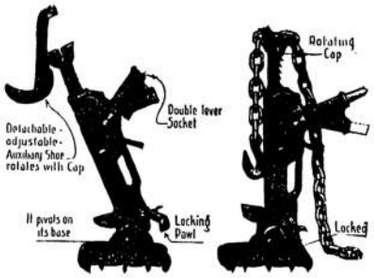

Fig. 1123. UNIVERSAL JACK.

Will lift, pull and push.

Suitable for every purpose for any industry. Having a pivoting base it enables the jack to be operated at full capacity at any angle from horizontal to vertical. Indispensable for contractors, tramways and railways, machinery and boiler makers, dock yards, etc. The steel hook supplied with 5 ft. special chain attachment permits the grappling of loads in awkward and difficult positions.

Price **£18 14 10.**

Fig. 1124. LIFT, PULL AND PUSH JACK AND CRAMP.

This jack is a most useful and popular tool, owing to its adaptability for various purposes ; it an be used as a lifting jack, a cramp, and a straining or expanding screw, thereby containing a combina- on of utility which would necessitate various tools to fulfil. It is well and strongly made and suitable or use in limited spaces.

WITHOUT RATCHET.

Size	To lift tons	Diam. of screw. inches	Height when down. inches	Approx. weight lbs.	Price each
1	1	$\frac{7}{8}$	6	3	**8/3**
2	1	1	8	4	**11/3**
3	$1\frac{1}{2}$	$1\frac{1}{4}$	10	10	**17/3**
4	2	$1\frac{1}{2}$	12	14	**24/6**
5	4	$1\frac{3}{4}$	14	23	**35/9**
6	6	2	16	38	**45/9**
7	8	$2\frac{1}{4}$	18	46	**58/6**
8	10	$2\frac{1}{2}$	20	68	**84/6**

WITH RATCHET LEVER.

Size	To lift. tons	Diam. of screw. ins.	Height when down. ins.	Approx. weight lbs.	Price each
1	1	$\frac{7}{8}$	6	6	**20/6**
2	1	1	8	7	**23/9**
3	$1\frac{1}{2}$	$1\frac{1}{4}$	10	11	**32/–**
4	2	$1\frac{1}{2}$	12	16	**40/–**
5	4	$1\frac{3}{4}$	14	26	**51/3**
6	6	2	16	41	**62/3**
7	8	$2\frac{1}{4}$	18	53	**80/–**
8	10	$2\frac{1}{2}$	20	78	**109/–**

Fig. 1124. Without ratchet lever.

Fig. 1125.
THE "ECHO" MOTOR CAR JACK.

This jack is specially designed for motor car use, the screw is quickly raised or lowered by spinning the covered horizontal wheel with the hand ; to accelerate the working the screw has a double quick thread. The jack can be supplied with ordinary straight handle or Universal Joint Handle ; to facilitate the use of the straight handle the small pinion wheel is set obliquely, the Universal Joint Handle however gives the advantage of enabling the operator to work it at any angle instead of from one position only, as with the straight handle.

The jack is thoroughly reliable and substantially made, there are no complicated working parts to get out of order, it is light and takes up little room, and as will be seen from the illustration is simplicity itself.

Height when down, 9" ; extended, 14". Weight 6 lbs. Will lift 20 cwts.

Malleable iron body. Mild steel screw.

Wheels and handle in malleable iron with straight wood grip.

Price : **A**—Plain bearings **17/3** each.
B—Ball bearings **18/9** each.

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LIFTING JACKS.

Fig. 1126. RATCHET SCREW JACKS.

Malleable iron case.

No.	1	2	3	4	5	6	7	8
To lift tons	5	6	8	10	12	16	20	30
Height when down, inches	17	20	23	25	28	28	28	24
Diameter of screw, inches	2	2⅛	2¼	2⅜	2½	2⅝	3	3⅝
Lift, inches	9½	12	14	16	18	18	17	11
Price, with brass nut	**27/6**	**32/–**	**40/–**	**47/6**	**60/–**	**70/–**	**110/–**	**140/–**
Price, without brass nut	**19/6**	**24/–**	**30/–**	**35/–**	**45/–**	**60/–**	**80/–**	**110/–**
Net weight (approx.), lbs.	31	42	51	64	79	90	108	132

Fig. 1127. TRIPOD JACKS.

Brass nut.

No.	1	2	3	4	5	6
To lift tons	2	3	4	5	6	8
Height when down, inches	9	12	15	18	21	24
Diameter of screw, inches	1½	1⅝	1¾	2	2⅛	2¼
Lift, inches	3	5½	7	9½	12	14
Price	**12/–**	**14/6**	**19/–**	**24/–**	**28/–**	**32/–**
Net weight (approx.), lbs.	8	11	20	28	38	51

No.	7	8	9	10	11	12
To lift, tons	10	12	16	18	20	25
Height when down, inches	27	30	30	30	30	30
Diameter of screw, inches	2⅜	2½	2⅝	2¾	3	3¼
Lift, inches	16	18	18	17	17	15½
Price	**44/–**	**50/–**	**60/–**	**80/–**	**95/–**	**115/–**
Nett weight (approx.), lbs.	56	73	90	104	119	147

Fig. 1128. BOTTLE JACKS.

Malleable iron case.

No.	1	2	3	4	5	6
To lift, tons	2	3	4	5	6	8
Height when down, inches	9	12	15	18	21	24
Diameter of screw, inches	1½	1⅝	1¾	2	2⅛	2¼
Lift, inches	3	5½	7	9½	12	14
Price, with brass nut	**12/–**	**13/9**	**18/9**	**23/–**	**27/6**	**33/–**
Price, without brass nut	**8/–**	**9/6**	**13/–**	**15/–**	**19/6**	**22/–**
Nett weight (approx.), lbs.	8	12	20	30	38	48

No.	7	8	9	10	11	12
To lift, tons	10	12	16	18	20	25
Height when down, inches	27	30	30	30	30	30
Diameter of screw, inches	2⅜	2½	2⅝	2¾	3	3¼
Lift, inches	16	18	18	17	17	15½
Price, with brass nut	**38/–**	**46/–**	**60/–**	**75/–**	**90/–**	**110/–**
Price, without brass nut	**29/–**	**34/–**	**52/–**	**60/–**	**75/–**	**90/–**
Nett weight (approx.), lbs.	59	76	82	96	108	140

Fig. 1129. BOTTLE JACKS.

Cast iron case.

No.	1	2	2A	3	4	5	6	7	8	9	10
To lift, tons	1½	2	3	4	5	6	8	10	12	15	18
Height when down, inches	12	15	15½	18	21	24	24	24	24	24	24
Diameter of screw, inches	1½	1½	1⅝	1¾	1¾	1⅞	2⅛	2⅜	2½	2⅝	2¾
Lift, inches	6	8½	8½	10½	12½	14	14	13	13	13	13
Price	**6/–**	**7/–**	**8/–**	**9/3**	**10/6**	**13/9**	**16/3**	**19/3**	**23/6**	**35/–**	**45/–**
Nett weight (approx.), lbs.	13	19	22	28	36	42	51	62	68	80	85

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LIFTING JACKS.

SHORT LIFT JACKS.

Malleable Iron Case.

Fig. 1130.
hout ratchet.

No.	1	2	3	4	5	6	7
To lift, tons...	3	5	5	6	8	10	10
Height when down, inches	6	6	8	9	9	9	12
Diameter of screw, inches	1½	1¾	1¾	2	2⅛	2¼	2¼
Lift, inches	1¾	1¾	3¼	3¾	3¾	3¾	5½
Price without ratchet ...	**11/-**	**12/-**	**13/6**	**17/-**	**18/6**	**20/-**	**24/-**
Price with ratchet	**15/6**	**16/6**	**18/-**	**22/-**	**24/6**	**27/-**	**31/-**
Nett weight (approx.) lbs.	8	9	11	14	16	19	23

No....	8	9	10	11	12	13
To lift, tons...	12	16	16	18	18	20
Height when down, inches	12	12	14	14	16	16
Diameter of screw, inches	2⅜	2½	2½	2¾	2¾	3
Lift, inches	5½	5½	7	7	8¼	8¼
Price without ratchet ...	**26/-**	**27/6**	**30/-**	**33/-**	**40/-**	**47/6**
Price with ratchet	**34/-**	**37/6**	**40/-**	**44/-**	**51/-**	**62/6**
Net weight (approx.), lbs.	28	32	36	42	49	56

Fig. 1131.
With ratchet.

PLATELAYERS' RAIL JACKS.

Fig. 1132.

Fig. 1132. Ordinary Pattern.

No.	1	2
Height when down, inches ...	24	24
Diameter of screw, inches ...	1½	2
Lift, inches	16	16
Price, with spanner	**35/-**	**44/-**
Nett weight (approx.), lbs.	58	76

Fig. 1133. Slipper Pattern.

No.	1	2
Diameter of screw, inches ...	1½	1¾
Price	**40/-**	**55/-**
Nett weight (approx.), lbs.	63	98

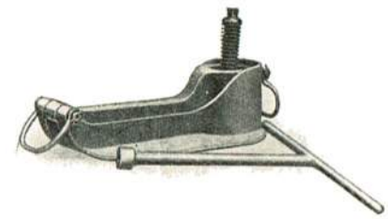

Fig. 1133.

CABLE DRUM JACKS.

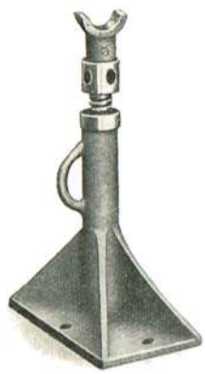

Fig. 1134.

Head, malleable iron. Body, cast iron.			
No.	0	1	2
ft, tons	3	6	8
ht when down, inches ...	21	25	29
eter of screw, inches ...	1⅝	1⅞	2⅛
inches...	11½	15	18
... ...	**27/6**	**32/6**	**47/6**
weight (approx.), lbs. ...	62	98	157

Fig. 1135.

Head, malleable iron. Nut, brass.	
Height when down, inches	29
Diameter of screw, inches	2¼
Lift, inches	15
Price	**85/6**
Net weight (approx.), lbs.	92

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LIFTING JACKS.

Fig. 1136.

Fig. 1136 TRAVERSING SCREW JACKS.

Malleable iron base and case. Mild steel screws.
Supplied complete with traversing ratchet lever and jack bar.

No.	00	0	1	2	3	4	5
To lift tons	5	6	8	10	12	15	18
Height when down, inches	20	20	20	24	24	24	26
Diameter of screw, inches	2	2⅛	2¼	2⅜	2⅜	2½	2¾
Lift, inches	9½	9½	9½	12½	12½	12	13
Traverse, inches	6½	6½	6½	9	12	12	14
Price—brass nut top and bottom	**58**/–	**60**/–	**62**/–	**72**/–	**78**/–	**88**/–	**122**/–
Price—brass bottom nut only	**56**/–	**58**/–	**60**/–	**70**/–	**76**/–	**85**/–	**115**/–
Nett weight (approx.), lbs.	65	67	71	96	101	122	173

No.	6	7	8	9	10	11
To lift, tons	20	20	25	30	35	40
Height when down, inches	27	22	24	26	26	26
Diameter of screw, inches	3	2¾	3¼	3½	3⅝	3¾
Lift, inches	13½	9½	9	11½	9½	9½
Traverse, inches	18	12	12	14	16	17
Price—brass nut top and bottom	**140**/–	**110**/–	**150**/–	**180**/–	**240**/–	**280**/–
Price—brass bottom nut only	**135**/–	**102**/–	**140**/–	**162**/6	**220**/–	—
Nett weight (approx.), lbs.	197	130	239	280	353	370

Fig. 1137.

Fig. 1137. TRAVERSING SCREW JACKS.

Malleable iron base, brass nut top and bottom.
Supplied complete with traversing ratchet lever and jack bar.

No.	00	0	1	2	3
To lift, tons	5	6	8	10	12
Height when down, inches	20	20	20	24	24
Diameter of screw, inches	2	2⅛	2¼	2⅜	2⅜
Lift, inches	9½	9½	9½	12½	12½
Traverse, inches	6½	6½	6½	9	12
Price	**61**/–	**63**/–	**65**/–	**80**/–	**85**/–
Nett weight (approx.), lbs.	64	66	70	94	103

No.	4	5	6	7
To lift, tons	15	18	20	20
Height when down, inches	24	26	27	22
Diameter of screw, inches	2½	2¾	3	2¾
Lift, inches	12	13	13½	9½
Traverse, inches	12	14	18	12
Price	**95**/–	**132**/–	**160**/–	**120**/–
Nett weight (approx.), lbs.	122	178	196	133

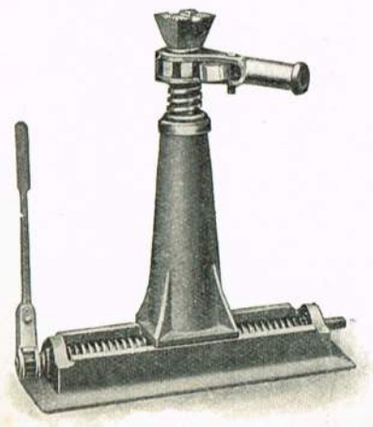

Fig. 1138.

Fig. 1138. TRAVERSING SCREW JACKS.

Malleable iron base and case. Mild steel screws.
Supplied complete with traversing ratchet lever and jack bar.

No.	00	0	1	2	3	4
To lift, tons	5	6	8	10	12	15
Height when down, inches	20	20	20	24	24	24
Diameter of screw, inches	2	2⅛	2¼	2⅜	2⅜	2½
Lift, inches	9½	9½	9½	12½	12½	12
Traverse	6½	6½	6½	9	12	12
Price	**46**/–	**50**/–	**55**/–	**60**/–	**65**/–	**75**/–
Nett weight (approx.), lbs.	61	63	70	91	99	118

No.	5	6	7	8	9	10
To lift, tons	18	20	20	25	30	35
Height when down, inches	26	27	22	24	26	26
Diameter of screw, inches	2¾	3	2¾	3¼	3½	3⅝
Lift, inches	13	13½	9½	9	11½	9½
Traverse, inches	14	18	12	12	14	16
Price	**102**/6	**125**/–	**90**/–	**130**/–	**153**/–	**200**/–
Nett weight (approx.), lbs.	162	193	125	234	274	350

The No. 7 size of each pattern is designed to meet the demand for a small 20 ton jack.

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LIFTING JACKS.

Fig. 1139. SHEWARD'S TELESCOPIC TRAVERSING JACKS.

Supplied complete with traversing ratchet lever and jack bar.

No.	0	1	2	3
To lift, tons	5	10	15	20
Height when down	16	16	18	20
Diameter of inside screw, inches	2¼	2½	2¾	3
Total lift, inches	10	10	11	13
Traverse, inches	6	8	12	14
Price	**87/6**	**110/–**	**140/–**	**190/–**
Nett weight (approx.), lbs.	94	126	168	259

No.	4	5	6	7
To lift, tons	25	30	35	40
Height when down, inches	20	20	21	21
Diameter of inside screw, inches	3⅜	3½	3¾	3⅞
Total lift, inches	11½	11	10¼	10¼
Traverse, inches	14	13	12	12
Price	**220/–**	**240/–**	**280/–**	**350/–**
Nett weight (approx.), lbs.	280	300	373	400

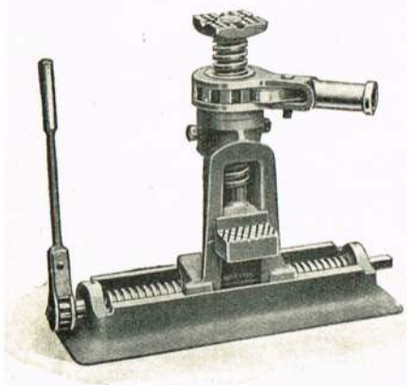

Fig. 1140. TRAMCAR TRAVERSING JACKS.

Supplied complete with traversing ratchet lever and jack bar.

No.	1	2	3	4	5	6
To lift on head, tons	6	12	15	20	25	30
Height when down, inches	15½	18	18	24	28	26
Diameter of screw, inches	2	2¼	2½	3	3¼	3½
Lift, inches	6	7	6	10	11½	9
Traverse, inches	6½	9	12	14	12	15
Price	**73/–**	**86/–**	**108/–**	**160/–**	**230/–**	**280/–**
Nett weight (approx.), lbs.	62	94	127	209	310	360

Fig. 1141. HALEY'S SCREW JACKS.

Wood case. Wheel, malleable iron. Pinion, mild steel.

No.	1	2	3	4
To lift on head, tons	2	4	6	8
Height when down, inches	28	31	32	34
Diameter of screw, inches	1¾	2	2¼	2½
Lift, inches	11½	14	14	14½
Price	**46/–**	**57/–**	**65/–**	**80/–**
Nett weight (approx.), lbs.	70	95	112	157

No.	5	6	7	8
To lift on head, tons	10	12	16	20
Height when down, inches	34	36	38	40
Diameter of screw, inches	2¾	3	3½	3⅞
Lift, inches	14½	14	14	14
Price	**88/–**	**112/–**	**220/–**	**250/–**
Nett weight (approx.), lbs.	167	214	300	417

Fig. 1142. HALEY'S SCREW JACKS.

Case and wheel, malleable iron. Pinion, mild steel.

No.	1	2	3	4
To lift on head, tons	2	4	6	8
Height when down, inches	25	26	28	30
Diameter of screw, inches	1¾	2	2¼	2½
Lift, inches	13½	13	14½	15½
Price	**55/–**	**66/–**	**77/–**	**93/–**
Nett weight (approx.), lbs.	64	84	97	135

No.	5	6	7	8
To lift on head, tons	10	12	16	20
Height when down, inches	31	34	36	38
Diameter of screw, inches	2¾	3	3½	3⅞
Lift, inches	15½	17	17½	13½
Price	**105/–**	**135/–**	**195/–**	**245/–**
Nett weight (approx.), lbs.	146	185	281	330

Jacks with a foot or claw are designed to lift the load specified on the **head**, and not more than 25 per cent. of the full load should be put on the foot or claw.

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LIFTING JACKS AND WALL CRABS.

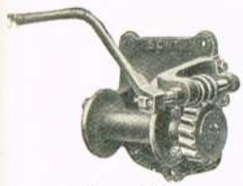
Single Purchase.

Fig. 1143.
RACK AND PINION JACK.

	Single Purchase		Double Purchase
To lift on head, tons	2	3	6
Height when down, inches	32	36	30
Lift, inches	18½	21	12½
Price each	**60/-**	**70/-**	**145/-**
Nett weight, approx., lbs.....	84	106	150

Jacks with a claw or foot are designed to lift the load specified on the **head**, and not more than 25 per cent. of the full load should be put on the claw.

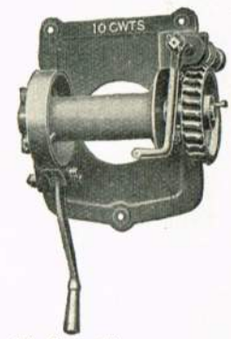
Double Purchase.



5 Cwt. Size.

Fig. 1150.
WALL CRABS, Worm Gear Pattern.

These crabs are made with the frame, barrel, and worm wheel of cast iron, with mild steel worm. They are self-sustaining, and, when made with brake, are arranged so that the worm and wheel can be disengaged by turning the handle the reverse way to that required for lifting.



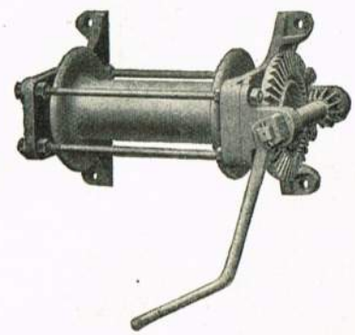
10 Cwt. Size.

No.	1	2	3	4
To lift direct by one man	3 cwts.	5 cwts.	10 cwts.	20 cwts.
Diameter of barrel	2½″	2½″	4″	5″
Effective length of barrel	5″	6½″	9″	10″
Revolutions of handle for one revolution of barrel	14	16	26	36
Price without brake	**£2 3 6**	**£2 12 0**	**£4 10 0**	**£7 7 0**
Price with brake	—	—	**£5 0 0**	**£8 0 0**
Net weight (approx.)	54 lbs.	63 lbs.	204 lbs. With brake	370 lbs. With brake

Fig. 1151.
BEVEL GEAR WALL-PATTERN CRABS.

Made with framing. Barrel and bevel wheel of cast iron, with wrought handle.

To lift direct by one man	3 cwts.
Diameter of barrel	4″
Effective length of barrel	9½″
Revolutions of handle for one revolution of barrel	3½
Price	**£5 0 0**
Nett weight (approx.)	100 lbs.
Ocean tons (approx.)	·05



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WALL CRABS.

SPUR GEAR.

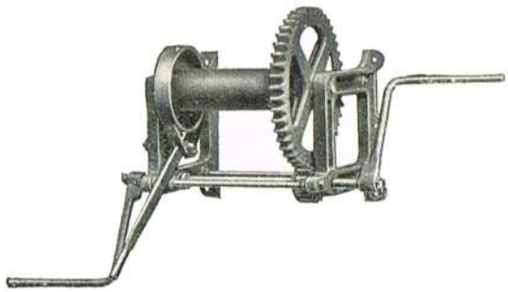

Fig. 1152.
Illustration of a No. 1 Crab.

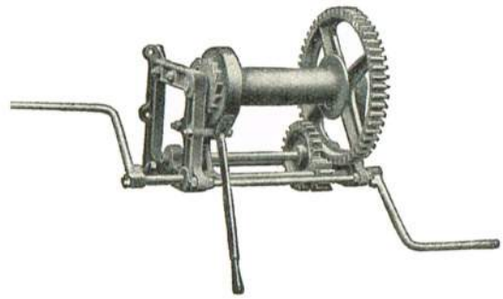

Fig. 1153.
Illustration of a No. 10A Crab.

These Crabs are made with cast-iron sides with accurately bored bearings. The handle and intermediate shafts are of bright steel, the handle squares being milled. The gearing is carefully moulded from accurate whole patterns. The handle shaft is arranged to be thrown out of gear so that the handles do not revolve when lowering by brake.

FOR WORKING WITH CHAIN OR HEMP ROPE.

Fig. 1152. SINGLE-PURCHASE.

No.	00	0	1	1a	2	3
To lift direct by two men, cwts.	5	7	10	12	15	18
Diameter of barrel, inches	4	5	5	5	5	5
Effective length of barrel ,inches	10	13	13	15	16	16
Price, with brake	**£5 6 0**	**£5 16 0**	**£6 2 0**	**£7 1 0**	**£8 4 0**	**£9 10 0**
Price, without brake	**£4 8 0**	**£4 15 0**	**£4 19 0**	**£5 17 0**	**£6 19 0**	**£8 0 0**
Nett weight with brake (approx.), lbs.	140	202	227	275	328	389

Fig. 1153. DOUBLE-PURCHASE.

No.	10	10a	11	11a	12
To lift direct by two men, cwts.	15	20	30	40	50
Diameter of barrel, inches ...	5	5	5	5	6
Effective length of barrel, inches	15	15½	18	21	24
Price, with brake	**£8 7 0**	**£9 1 0**	**£11 1 0**	**£13 15 0**	**£16 8 0**
Price, without brake	**£7 3 0**	**£7 17 0**	**£9 12 0**	**£12 0 0**	**£14 8 0**
Net weight with brake (approx.), lbs.	295	336	457	560	704

FOR WORKING WITH WIRE ROPE.

Fig. 1154. DOUBLE-PURCHASE.

No.	10	10a	11	11a	12
'o lift direct by two men, cwts.	10	15	20	30	40
Vire rope, circumference, inches	1	1¼	1½	1¾	1¾
Vire rope, approx. diameter, inches	5/16	7/16	½	9/16	9/16
Diameter of barrel, inches	6	6	8	8	10
ffective length of barrel, inches	15	15½	18	21	24
mount of wire rope barrel will take on in one lap, feet	79	59	80	83	115
rice, with brake	**£9 10 0**	**£10 10 0**	**£13 10 0**	**£16 10 0**	**£20 15 0**
rice, without brake	**£8 6 0**	**£9 6 0**	**£12 0 0**	**£14 15 0**	**£18 15 0**
xtra for turned and grooved barrels	**£2 10 0**	**£2 10 0**	**£3 0 0**	**£3 0 0**	**£4 0 0**
ett weight with brake (approx.), lbs.	307	347	497	604	778

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HOISTING CRABS.

CAST IRON SIDES.

FOR WORKING WITH CHAIN OR HEMP ROPE.

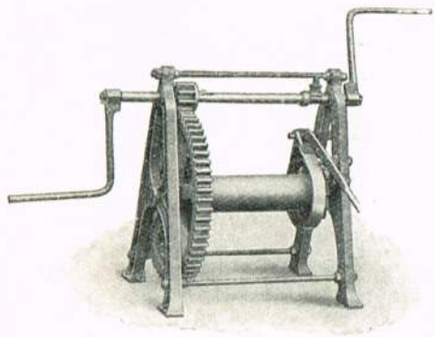

Fig. 1155.

Illustration of a No. 3 Crab.

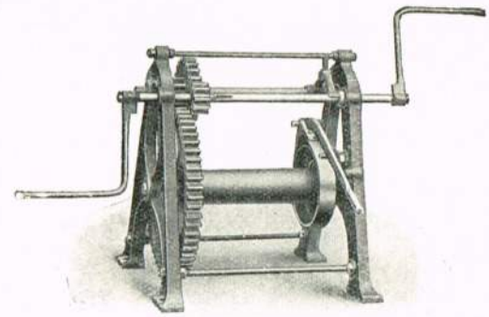

Fig. 1156.

Illustration of a No. 11A Crab.

These Crabs are made with cast-iron sides, with accurately bored bearings. The handle and intermediate shafts are of bright steel, the handle squares being milled. The gearing is carefully moulded from accurate whole patterns. The handle shaft is arranged to be thrown out of gear so that the handles do not revolve when lowering by brake.

Fig. 1155. SINGLE-PURCHASE.

No.	0	1	1a	2	3	4	5
To lift with 2 and 3 sheave pulley blocks, tons	1	2	3	4	5	6	6
Diameter of barrel	5	5	5	5	5	6	6
Effective length of barrel, inches	13	13	15	16	16	20	20½
Price, with brake	**£5 16 0**	**£6 2 0**	**£7 1 0**	**£8 4 0**	**£9 10 0**	**£12 0 0**	**£14 0 0**
Price, without brake	**£4 15 0**	**£4 19 0**	**£5 17 0**	**£6 19 0**	**£8 0 0**	**£10 10 0**	**£12 4 0**
Extra if brass bushed	**£0 19 0**	**£0 19 0**	**£1 2 0**	**£1 5 0**	**£1 9 0**	**£1 13 0**	**£1 18 0**
Extra if with screw brake	**£0 12 0**	**£0 12 0**	**£0 14 0**	**£0 16 0**	**£0 18 0**	**£1 0 0**	**£1 0 0**
Nett weight with brake (approx.). lbs.	212	238	275	327	392	566	714

Fig. 1156. DOUBLE-PURCHASE.

No.	10	10a	11	11a	12
To lift with 2 and 3 sheave pulley blocks, tons	3	4	5	7	9
Diameter of barrel, inches	5	5	5	5	6
Effective length of barrel, inches	15	15½	18	21	24
Price, with brake	**£8 7 0**	**£9 1 0**	**£11 1 0**	**£13 15 0**	**£16 8 0**
Price, without brake	**£7 3 0**	**£7 17 0**	**£9 12 0**	**£12 0 0**	**£14 8 0**
Extra if brass bushed	**£1 6 0**	**£1 10 0**	**£1 15 0**	**£2 0 0**	**£2 6 0**
Extra if with screw brake	**£0 15 0**	**£0 15 0**	**£1 0 0**	**£1 0 0**	**£1 5 0**
Nett weight with brake (approx.), lbs.	317	360	476	621	758

No.	13	14	15	16
To lift with 2 and 3 sheave pulley blocks, tons	12	15	18	24
Diameter of barrel, inches	6	6¾	8	8
Effective length of barrel	24½	25	26	29½
Price, with brake	**£19 10 0**	**£25 0 0**	**£31 14 0**	**£39 0 0**
Price, without brake	**£17 8 0**	**£22 10 0**	**£29 0 0**	**£36 0 0**
Extra if brass bushed	**£2 12 0**	**£3 10 0**	**£4 0 0**	**£4 0 0**
Extra if with screw brake	**£1 5 0**	**£1 5 0**	**£1 10 0**	**£1 10 0**
Nett weight with brake (approx.), lbs.	945	1254	1743	1916

All the above Crabs will lift one-third the weight specified from the barrel direct.

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HOISTING CRABS.

STEEL PLATE SIDES.

FOR WORKING WITH CHAIN OR HEMP ROPE.

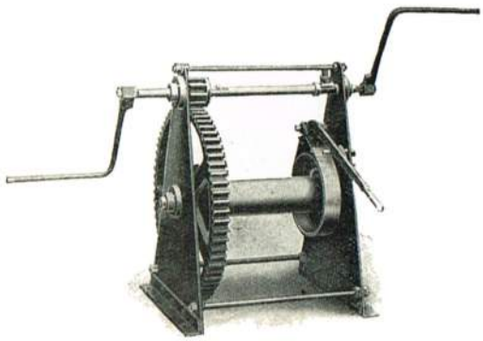

Fig. 1159.
Illustration of a No. 3 Crab.

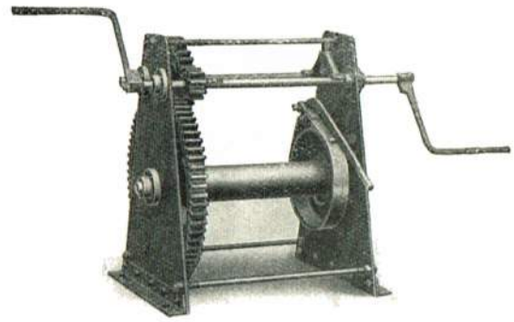

Fig. 1160.
Illustration of a No. 11A Crab.

These Crabs are made with steel plate sides, stiffened with angles rivetted on their bottom edges, with holding-down bolt holes. Cast-iron bearing bosses accurately bored, spigotted, and rivetted to the sides. The handle and intermediate shafts are of bright steel, the handle squares being milled. The gearing is carefully moulded from accurate whole patterns. The handle shaft is arranged to be thrown out of gear so that the handles do not revolve when lowering by brake.

Fig. 1159. SINGLE-PURCHASE.

No.	1	1a	2	3	4	5
To lift with 2 and 3 sheave pulley blocks tons	2	3	4	5	6	7
Diameter of barrel, inches	5	5	5	5	6	6
Effective length of barrel, inches	13	15	16	16	20	20½
Price, with brake	£9 2 0	£10 1 0	£11 7 0	£12 13 0	£15 5 0	£17 5 0
Price, without brake	£7 19 0	£8 17 0	£10 2 0	£11 3 0	£13 15 0	£15 9 0
Extra if brass bushed	£0 19 0	£1 2 0	£1 5 0	£1 9 0	£1 13 0	£1 18 0
Extra if with screw brake	£0 12 0	£0 14 0	£0 16 0	£0 18 0	£1 0 0	£1 0 0
Nett weight with brake (approx.), lbs.	234	266	327	381	566	714

Fig. 1160. DOUBLE-PURCHASE.

No.	10	10a	11	11a	12
To lift with 2 and 3 sheave pulley blocks, tons	3	4	5	7	9
Diameter of barrel, inches	5	5	5	6	6
Effective length of barrell	15	15½	18	21	24
Price, with brake	£12 7 0	£13 1 0	£15 1 0	£18 1 0	£21 1 0
Price without brake	£11 3 0	£11 17 0	£13 13 0	£16 6 0	£19 1 0
Extra if brass bushed,	£1 6 0	£1 10 0	£1 15 0	£2 0 0	£2 6 0
Extra if with screw brake	£0 15 0	£0 15 0	£1 0 0	£1 0 0	£1 5 0
Nett weight with brake (approx.), lbs.	328	360	458	572	763

No.	13	14	15	16
To lift with 2 and 3 sheave pulley blocks, tons	12	15	18	24
Diameter of barrel, inches	6	6¾	8	8
Effective length of barrel, inches	24½	25	26	29½
Price, with brake	£24 3 0	£29 13 0	£36 10 0	£43 16 0
Price, without brake	£22 1 0	£27 3 0	£33 16 0	£40 16 0
Extra if brass bushed	£2 12 0	£3 10 0	£4 0 0	£4 0 0
Extra if with screw brake	£1 5 0	£1 5 0	£1 10 0	£1 10 0
Nett weight with brake (approx.)	890	1192	1583	1840

All the above Crabs will lift one-third the weight specified from the barrel direct.

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HOISTING CRABS.

FOR WORKING WITH WIRE ROPE.

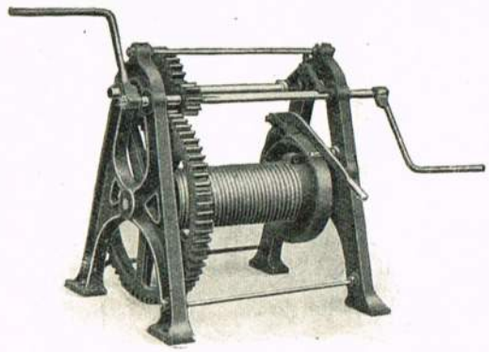

Fig. 1157.

Illustration of a No. 11A Crab with Cast Iron sides. Showing grooved barrel.

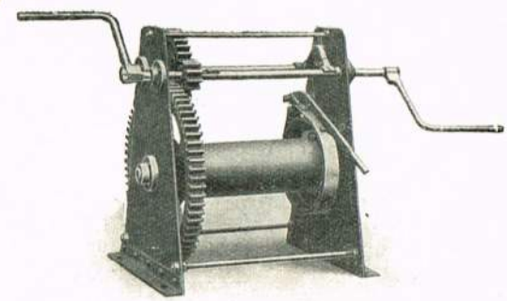

Fig. 1158.

Illustration of a No. 11 Crab with Steel Plate sides. Showing plain barrel.

These Crabs are made with either cast-iron or steel plate sides, the latter being stiffened with angles rivetted on their bottom edges with holding-down bolt holes, the cast-iron bearing bosses being accurately bored, spigoited, and rivetted to the sides.

The gear is arranged to work in single and double purchase. The handle and intermediate shafts are of bright steel, the handle squares being milled. The gearing is carefully moulded from accurate whole patterns. The handle shaft is arranged to be thrown out of gear so that the handles do not revolve when lowering by brake. The barrel can be made plain, or if desired it can be turned and grooved to take the wire rope, at the extra cost named below.

No.	10	10a	11	11a	12
To lift direct from barrel, cwts.	10	15	20	30	40
Wire rope circumference, inches	1	1¼	1½	1¾	1¾
Wire rope, approx. diameter, inches	5/16	7/16	½	9/16	9/16
Diameter of barrel, inches	6	6	8	8	10
Effective length of barrel, inches	15	15½	18	21	24
Amount of wire rope barrel will take on in one lap, feet	79	59	80	83	115
With cast iron sides—					
Price, with brake	**£9 10 0**	**£10 10 0**	**£13 10 0**	**£16 10 0**	**£20 15 0**
Price without brake	**£8 6 0**	**£9 6 0**	**£12 0 0**	**£14 15 0**	**£18 15 0**
Net weight with brake (approx.) lbs.	329	371	516	665	832
With steel plate sides—					
Price, with brake	**£13 10 0**	**£14 10 0**	**£17 10 0**	**£20 16 0**	**£25 8 0**
Price, without brake	**£12 6 0**	**£13 6 0**	**£16 0 0**	**£19 1 0**	**£23 8 0**
Nett weight with brake (approx.), lbs.	340	371	498	616	837
Extra for turned and grooved barrels	**£2 10 0**	**£2 10 0**	**£3 0 0**	**£3 0 0**	**£4 0** 0
Extra if brass bushed	**£1 6 0**	**£1 10 0**	**£1 15 0**	**£2 0 0**	**£2 6 0**

No.	13	14	15	16
To lift direct from barrel, cwts.	50	60	80	100
Wire rope, circumference, inches	2	2¼	2¾	3
Wire rope, approx. diameter, inches	⅝	11/16	⅞	15/16
Diameter of barrel, inches	10	12	13	14
Effective length of barrel	24½	25	26	29½
Amount of wire rope barrel will take on in one lap, feet	108	120	108	120
With cast iron sides—				
Price, with brake	**£24 10 0**	**£30 0 0**	**£36 14 0**	**£44 0 0**
Price, without brake	**£22 8 0**	**£27 10 0**	**£34 0 0**	**£41 0 0**
Net weight with brake (approx.), lbs.	1020	1338	1834	2046
With steel plate sides—				
Price, with brake	**£29 3 0**	**£34 12 0**	**£41 10 0**	**£48 16 0**
Price, without brake	**£27 1 0**	**£32 2 0**	**£38 16 0**	**£45 16 0**
Nett weight with brake (approx.), lbs.	974	1276	1674	1966
Extra for turned and grooved barrels	**£4 0 0**	**£5 0 0**	**£6 0 0**	**£7 0 0**
Extra if brass bushed	**£2 12 0**	**£3 10 0**	**£4 0 0**	**£4 0 0**

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SHEAR LEGS, Etc.

Fig. 1161. HAND PILE DRIVERS.

Complete with Crab, Monkey, Chain, etc.

The frame is made of best pitch pine, strongly framed and bolted together, the larger sizes having cross-bracing composed of mild steel angles.

The monkey is of cast-iron of the weight specified.

The crab winch is provided with brake; the 1½ ton size has double-purchase lifting gear and the smaller sizes single-purchase.

The machine is provided with ordinary nippers, hand rope, sufficient best tested short link crane chain, and is in all respects complete and ready to put to work.

We usually supply our pile drivers mounted on small rail wheels, so as to be readily moved from pile to pile.

Weight of monkey. cwts.	Complete with woodwork frame 25 feet high. Approx. weight cwts.	Price £ s. d.	Extra per 5 feet of extra height up to 35 feet. Approx. weight cwts.	Price £ s. d.	Complete set of ironwork only. Approx. weight cwts.	Price £ s. d.	Less if without wheels and axles. £ s. d.
10	38	**77 0 0**	4½	**7 0 0**	19	**45 10 0**	**6 5 0**
15	50	**93 0 0**	4½	**8 0 0**	24	**54 10 0**	**6 10 0**
20	61	**110 0 0**	6	**8 15 0**	31	**65 15 0**	**6 15 0**

Fig. 1162

RINGING ENGINES OR SMALL PILE DRIVERS.

The frame is of best pitch pine, framed and bolted together. The monkey is of cast-iron of the weight specified, and attached to it are as many ropes as will be required to work the machine. Complete and ready for use.

Weight of monkey cwts.	Height of frame feet	Complete Approx. weight cwt.	Price £ s. d.	Ironwork only. Approx. weight cwts.	Price £ s. d.
2	14	7	**19 5 0**	3½	**8 15 0**
3	14	8½	**22 0 0**	4½	**10 10 0**
4	14	10½	**25 0 0**	5¾	**12 10 0**
5	14	12	**28 10 0**	6¾	**14 15 0**

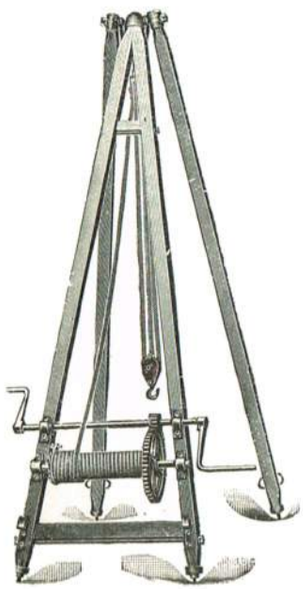

Fig. 1163.

SHEAR LEGS (Timber Legs).

As illustration, complete with gearing barrel, hemp rope, pulley blocks, but without rope.

To lift	1 ton	2 tons	3 tons
Length of legs	14 ft. 0 in.	14 ft. 0 in.	14 ft. 0 in.
Hook of the bottom block will rise about ...	8 ft. 9 in.	8 ft. 3 in.	7 ft. 6 in.
Price complete ...	**£18 15 0**	**£21 10 0**	**£25 0 0**
Approximate weight ...	4½ cwts.	6½ cwts.	7¾ cwts.
Price ironwork only ...	**£10 15 0**	**£12 10 0**	**£15 5 0**
Approximate weight	2 cwts.	2½ cwts.	3 cwts.

Fig. 1164.

IMPROVED TUBULAR SHEAR LEGS.

With three legs complete. Pulley blocks extra.

Height feet	Tube, inside diameter inches		Price
10	1¼	...	**£9 0 0**
15	1¼	...	**£10 0 0**
10	1½	...	**£10 0 0**
15	1½	...	**£11 0 0**
12 ...	2	...	**£12 10 0**
16 ...	2	...	**£14 0 0**

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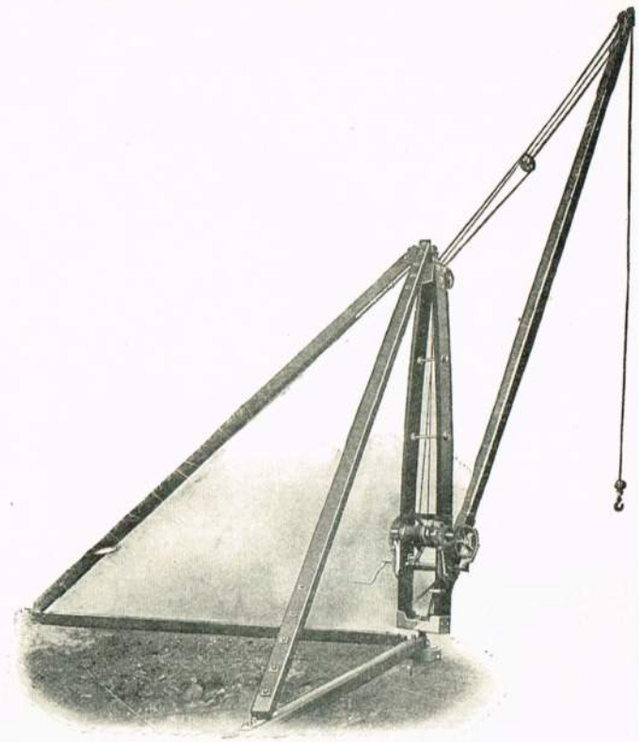
CRANES.

Fig. 1165. DERRICK CRANES. Timber made of best selected pitch pine. Fitted with single and double purchase lifting gear. Lever brake. Jib well supported, and weight lifted by wire rope of large carrying capacity.

To carry.	Length of Jib, feet.	Length of Upright in feet.	Price £ s. d.
10 cwt.	21	9	**34 0 0**
15 ,,	28	10	**40 15 0**
1 ton	30	13	**46 10 0**
1 ,,	35	15	**50 15 0**
30 cwt.	33	15	**62 0 0**
30 ,,	35	15	**65 0 0**
30 ,,	37	17	**69 0 0**
2 ton	35	17	**76 15 0**
2 ,,	40	17	**80 5 0**
2 ,,	45	19	**86 5 0**
50 cwt.	40	19	**94 10 0**
3 ton	40	20	**107 15 0**
3 ,,	45	20	**114 15 0**
4 ,,	40	20	**129 10 0**
5 ,,	40	21	**174 0 0**
5 ,,	45	21	**182 0 0**
7 ,,	45 Split Jib	21	**245 0 0**
10 ,,	50 ,, ,,	25	**303 10 0**



Sets of Wrought Iron Tubular Shear Legs for well boring or other purposes for use with ordinary crab winch or pulley blocks.

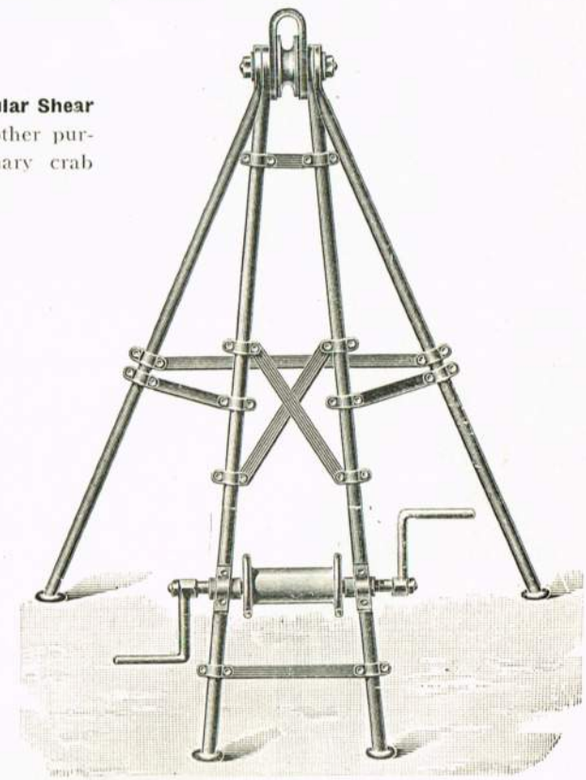


Fig. 1166.

Height, feet	10	15	10	15	12	16
Tube inside diam., inches...	1¼	1¼	1½	1½	2	2
Price	**£4 10s.**	**£5**	**£5**	**£5 10s.**	**£6 5s.**	**£7**

Fig. 1167 is braced and fitted with windlass roller and two handles. 15 feet in height.

Suitable for Estimates, No. 1—3 ... ... Price	**£12 0 0**
,, ,, ,, 3 ... ... ,,	**£18 0 0**
,, ,, ,, 4—5A ... ... ,,	**£22 10 0**
,, ,, ,, 5B and 5C ... ,,	**£29 10 0**
,, ,, ,, 6 ... ... ,,	**£35 0 0**

Larger sizes fitted with fast and loose driving pulleys quoted for.

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CRANES.

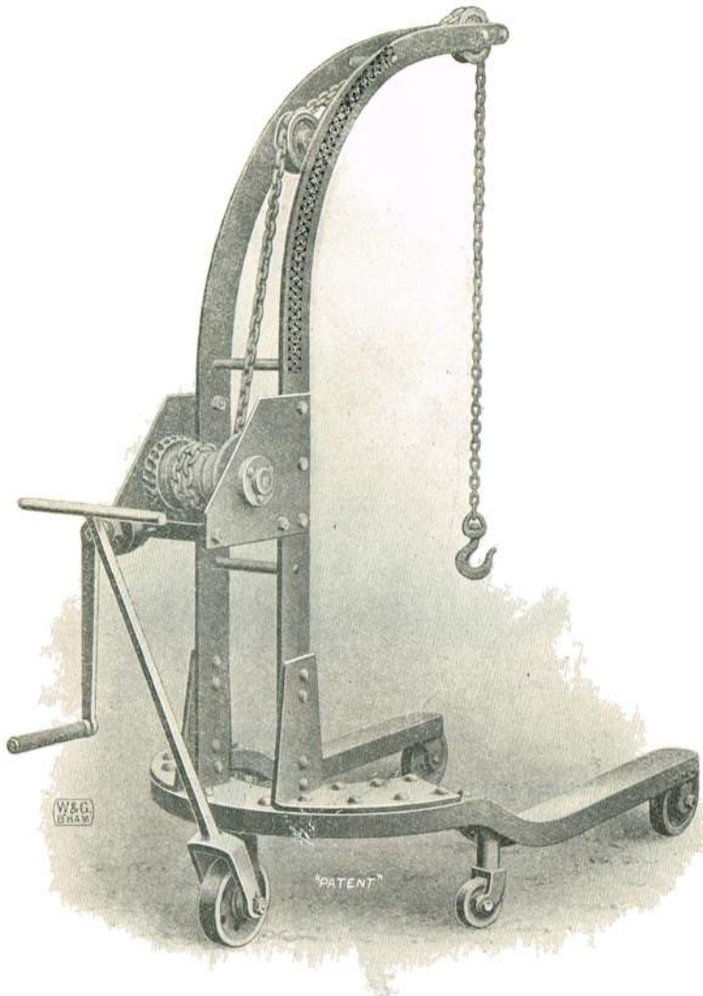

Fig. 1169.

SELF-SUSTAINING PORTABLE WORKSHOP CRANE of Improved Design.

Jib is of rolled steel channel section, bolted to a suitable channel base.

The Crane travels on roller-bearing wheels, the rear of which is mounted on an eccentric shaft. When handle is released, this causes a brake to be put on crane and prevents it moving.

The base is built very low to enable crane to be run under machines with limited openings.

Can be made suitable for chain or wire rope. Made any height to suit customers' requirements.

Three-ton size is supplied with bottom block-

A most substantially built tool for with. standing rough handling.

Made to lift Tons.	Height from floor to highest point of crane. Inches	Price.
½	90	**£27 4 0**
1	96	**£32 12 0**
1½	102	**£38 8 0**
2	108	**£43 12 0**
3	144	**£54 8 0**

Fig. 1170. "MILLENNIUM" MOTOR CAR TROLLEYS.

Will move light or heavy cars with ease. Can be turned in their own length. Mounted on ball castors. A necessity in every garage and show room.

Price :	Iron wheels	**£7 10 0** per pair
	Rubber-tyred wheels	**£8 5 0** ,,

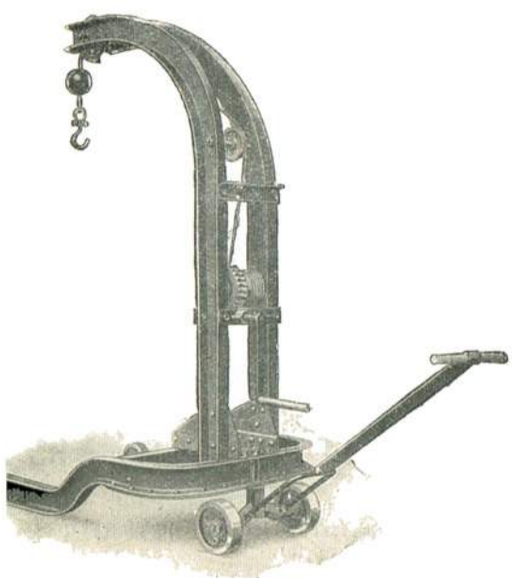

Fig. 1171.

NEW PATTERN SELF-SUSTAINING PORTABLE SHOP CRANE,

With wire rope. Built entirely of steel. Self-sustaining. Saves time and labour. The front of the U base frame locks the handles in position when not in use, thus ensuring great rigidity. Owing to the cranked design of base this crane has very easy movement, and can be used in most inaccessible positions.

Price **£35 10 0** each.

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SLING CHAINS AND HOOKS.

Fig. 1180. Collar Chain.

Fig. 1181. Lashing Chain.

Fig. 1182. Double Sling Chain.

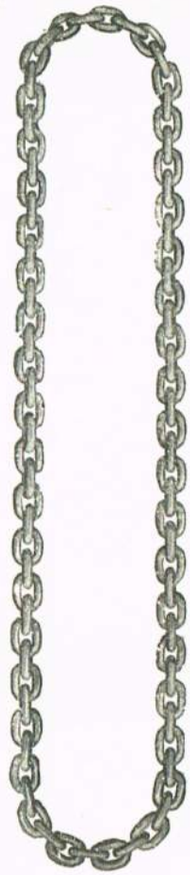

Fig. 1183. Endless Chain.

Fig. 1184. Case Chain.

Fig. 1185. Cask Sling, similar to above, but fitted with 2 prong hooks to firmly hold barrel in position. Made with best quality materials and a high standard of workmanship.

Chain, dia. of iron, ins.	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1
Test load, cwts.	8	15	22½	32½	45	60	75	92½	112½	135	160	180	210	240
Safe load, cwts.	4	7½	10	15	22½	30	37½	45	55	70	80	90	100	120
Length of chain, feet	5	5	6	6	7	7	8	8	9	9	10	10	12	12
Lashing Chain Price per sling	**6/6**	**7/–**	**8/6**	**10/–**	**13/6**	**16/–**	**21/–**	**27/6**	**35/–**	**42/6**	**50/–**	**60/–**	**75/–**	**95/–**
Collar Sling Price per sling	**7/6**	**8/6**	**9/6**	**10/6**	**14/6**	**16/–**	**21/–**	**26/6**	**33/–**	**40/–**	**47/6**	**57/6**	**70/–**	**87/6**
Length more or less, per foot	**–/9**	**–/10**	**–/11**	**1/–**	**1/2**	**1/5**	**1/8**	**1/10**	**2/–**	**2/3**	**2/6**	**3/–**	**3/3**	**3/6**

Chain, dia. of iron, ins.	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1
Test load on double chain, cwts.	16	30	45	65	90	120	150	185	225	270	320	360	420	480
Safe load on double chain, cwts.	8	15	22½	32½	45	60	75	92½	112½	135	160	180	210	240
Double Sling. Price complete, with ring, hooks and 2 chains each, 6ft.	**14/–**	**15/–**	**16/6**	**19/–**	**24/–**	**28/–**	**35/–**	**47/6**	**60/–**	**70/–**	**80/–**	**95/–**	**120/–**	**150/-**
Endless Sling. 12ft. single or 6ft. double	**12/–**	**13/–**	**14/–**	**16/–**	**17/6**	**20/–**	**24/–**	**27/–**	**32/–**	**35/–**	**39/–**	**42/–**	**50/–**	**55/–**
Extra length per double foot	**1/6**	**1/8**	**1/10**	**2/–**	**2/4**	**2/10**	**3/4**	**3/8**	**4/–**	**4/6**	**5/–**	**6/–**	**6/6**	**7/–**

Chain, diameter of iron, inches	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4
Test load, cwts. on double chain	16	30	45	65	90	120	150	185	270
Safe load, cwts. ,, ,, ...	8	12	18	30	40	50	60	75	110
Cask Sling. Price complete with ring, 2 cask hooks and 6ft. chain	**13/–**	**14/–**	**15/–**	**16/–**	**20/–**	**24/–**	**28/–**	**36/–**	**52/6**
Case Sling. Price complete with ring, 2 case hooks and 6ft. chain	**14/–**	**15/–**	**16/–**	**17/6**	**22/6**	**30/–**	**35/–**	**45/–**	**65/–**
Extra chain, per foot	**–/9**	**–/10**	**–/11**	**1/–**	**1/2**	**1/5**	**1/8**	**1/10**	**2/3**

Fig. 1184. Swivel Hook.

Fig. 1185. Ball-bearing Swivel Hook.

To lift cwts.	Price each	To lift cwts.	Price each
8	**3/6**	6	**8/9**
12	**4/–**	8	**10/6**
18	**4/6**	22	**13/9**
24	**5/–**	27	**16/6**
30	**6/–**	41	**18/6**
40	**7/6**	48	**22/6**
50	**8/6**	60	**28/6**
60	**10/–**	80	**35/6**
		90	**45/6**
		105	**55/–**

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PULLEY BLOCKS.

Fig. 1186. Weston's mproved Differential Pulley Block with Guide.

Fig. 1187. Worm-Geared Pulley Block.

Fig. 1188. Travelling Pulley Block, Ungeared trolley, ½-ton size.

Fig. 1189. Improved Travelling Pulley Block with geared trolley.

Fig. 1186.

sted to tons	¼	½	¾	1	1½	2	3	4
ocks, per set, with guides	**8/6**	**12/6**	**14/6**	**17/6**	**25/–**	**32/–**	**45/–**	**65/–**
ight chain, per foot	**–/6**	**–/6**	**–/6½**	**–/7**	**–/8**	**–/9**	**–/11**	**1/–**

Length of chain required is four times the height of lift. To lift a given weight, order the next largest sizes.

All blocks and chains tested before leaving works.

Fig. 1187.

e working load, tons	¼	½	1	1½	2	3	4	5	6	7½	10
sted to tons	⅜	¾	1½	2¼	3	4½	6	7½	9	11¼	15
ce complete with chains for 10 ft. lift	**60/–**	**75/–**	**86/–**	**97/–**	**120/–**	**151/–**	**175/–**	**210/–**	**270/–**	**300/–**	**465/–**
tra for lift greater than 10 ft	**1/6**	**1/8**	**2/4**	**2/6**	**2/8**	**3/–**	**3/8**	**4/2**	**4/8**	**5/2**	**8/4**

Fig. 1188.

orking load, tons	½	1	1½	2	3	....
ce complete with chains for 10 ft. lift	**125/–**	**132/6**	**150/–**	**177/6**	**207/6**	....
ad chain extra per foot	**–/7**	**–/8**	**–/9**	**–/10**	**1/–**	....
nd chain extra per foot	**–/6**	**–/6**	**–/6**	**–/6**	**–/6**	....

Fig. 1189.

½	1	1½	2	3	4	5	7½	10
152/6	**160/–**	**187/6**	**220/–**	**257/6**	**335/–**	**370/–**	**460/–**	**647/6**
–/7	**–/8**	**–/9**	**–/10**	**1/–**	**1/3**	**1/6**	**2/–**	**3/6**
–/6	**–/6**	**–/6**	**–/6**	**–/6**	**–/7**	**–/7**	**–/7**	**–/8**

Note.—The ½-ton size lifts on a single chain.

All tested to 50% overload before leaving works.

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TROLLEYS, GIN BLOCKS, Etc.

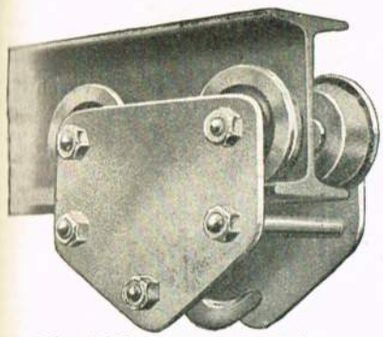

Fig. 1190. Ungeared Trolley.

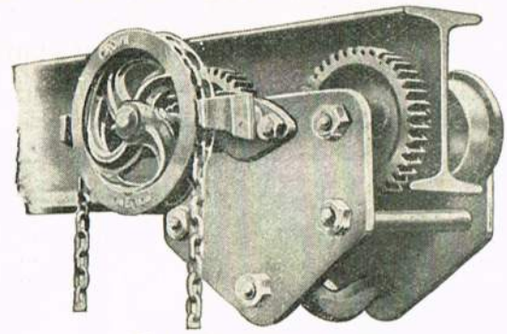

Fig. 1191. Geared Trolley.

The above are for use in conjunction with worm gear pulley blocks.

Working load, tons	¼	1	1½	2	3	4	5	7½	10
Fig. 1190. Ungeared	**50/–**	**53/–**	**60/–**	**65/–**	**80/–**	**105/–**	**125/–**	**180/–**	**193/–**
Fig. 1191. Geared	**75/–**	**80/–**	**90/–**	**100/–**	**110/–**	**160/–**	**170/–**	**230/–**	**270/–**
Hand chain, per foot	**–/6**	**–/6**	**–/6**	**–/6**	**–/6**	**–/7**	**–/7**	**–/7**	**–/8**
Extra for ball-bearing travelling wheels	**40/–**	**46/–**	**53/–**	**62/–**	**72/–**	**83/–**	**94/–**	**110/–**	**125/–**

Fig. 1192. Gin Blocks.

Diam. sheave inches	Width of groove	Price complete
6	1	**4/6**
8	1⅛	**5/6**
9	1⅛	**6/–**
10	1⅛	**6/6**
12	1¼	**8/3**
14	1¼	**9/–**

Fig. 1193. Hinge Snatch.

Fig. 1194. One Sheave, with Becket.

Fig. 1195. Two Sheave, with Becket.

Fig. 1196/7. Three and Four Sheave.

LONDON PATTERN PULLEY BLOCKS WITH SWIVEL HOOKS.

For Manilla, Hemp Rope, or Chain, but **not** Wire Rope.

SAFE WORKING LOADS.

Diameter of sheave, inches	2½	3½	4	4¾	5	6	7	8
For rope diameter, inches	⅜	½	⅝	¾	⅞	1	1¼	1½
1 and 1 sheave—cwts.	1¼	3½	6	10	14	22	30	42
2 and 1 sheave—cwts.	2	5½	9	14	20	30	40	60
2 and 2 sheave—cwts.	2½	6½	11	17	26	38	50	75
3 and 2 sheave—cwts.	3	8	13	20	30	46	60	90
3 and 3 sheave—cwts.	3½	9½	15	23	34	54	70	105
4 and 3 sheave—cwts.	4	11	17	26	38	62	80	115

PRICES, with Cast Iron Sheaves.

Diam. of sheave, inches	2½	3½	4	4¾	5	6	7	8	9
Width of groove, inches	⅜	½	⅝	¾	⅞	1	1¼	1½	1¾
Fig. 1193. Hinge snatch, each	**7/3**	**7/9**	**8/6**	**10/–**	**12/6**	**15/–**	**18/–**	**22/6**	**32/–**
Fig. 1194. One sheave, each	**2/6**	**3/–**	**3/9**	**5/3**	**6/6**	**7/6**	**9/6**	**12/6**	**20/–**
Fig. 1195. Two sheave, each	**3/6**	**5/–**	**5/9**	**7/3**	**9/6**	**11/–**	**16/–**	**22/6**	**32/–**
Fig. 1196. Three sheave, each....	**4/6**	**5/9**	**7/3**	**9/6**	**12/6**	**14/6**	**21/–**	**30/–**	**45/–**
Fig. 1197. Four sheave, each	**6/–**	**6/9**	**9/–**	**13/–**	**17/3**	**20/–**	**30/–**	**42/6**	**65/–**
Add per sheave if brass required instead of iron, each	**–/9**	**1/2**	**1/9**	**2/8**	**3/9**	**5/–**	**6/3**	**9/3**	**14/9**
Spare sheaves, Brass, each	**1/–**	**1/6**	**2/3**	**3/6**	**5/–**	**6/6**	**8/9**	**12/9**	**19/3**
,, ,, Iron, each	**–/3**	**–/4**	**–/6**	**–/10**	**1/3**	**1/6**	**2/6**	**3/6**	**4/6**

8″ × 4 sheave, also 9″ × 3 and 4 sheave blocks are fitted with fast shackles or swivel rings.

Improved WIRE Rope Pulley Blocks, with Swivel Hooks. Same design as above.

SAFE WORKING LOADS.

Diam. of sheave, inches	5	6	7	8	9	10
For wire rope, cir.	¾	1	1¼	1½	1¾	2
1 and 1 sheave—cwts.	14	20	30	40	60	80
2 and 1 sheave—cwts.	21	30	45	60	90	120
2 and 2 sheave—cwts.	28	40	60	80	120	160
3 and 2 sheave—cwts.	35	50	75	100	150	200
3 and 3 sheave—cwts.	42	60	90	120	180	240
4 and 3 sheave—cwts.	49	70	105	140	210	280

PRICES, with Cast Iron Sheaves.

Diam. of sheave, inches	5	6	7	8	9	10
For wire rope, circum., inches	¾	1	1¼	1½	1¾	2
,, ,, diam., inches	¼	5/16	⅜	7/16	½	⅝
Fig. 1198. Hinge snatch block, each	**18/–**	**21/–**	**26/–**	**36/–**	**48/–**	**60/–**
Fig. 1199. One sheave, each	**12/–**	**15/–**	**18/–**	**24/–**	**35/–**	**44/–**
Fig. 1200. Two sheave, each	**20/–**	**24/–**	**30/–**	**43/–**	**62/–**	**75/–**
Fig. 1201. Three sheave, each	**26/–**	**31/–**	**39/–**	**60/–**	**86/–**	**105/–**
Fig. 1202. Four sheave, each	**35/–**	**42/–**	**54/–**	**86/–**	**115/–**	**130/-**
Spare cast iron sheaves, each	**2/6**	**3/–**	**4/–**	**5/–**	**6/–**	**7/6**
Extra per sheave, gun-metal bushes, each	**1/6**	**1/9**	**2/–**	**2/3**	**2/6**	**3/–**

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JIM CROWS.

Fig. 1203. JIM CROWS.

Size.	To Bend Steel Rails. lbs.	Dia. of Screw. inches.	Distance between Jaws. inches.	Approx. Weight. lbs.	Price each.	Lever extra, each.	Weight of Lever. lbs.
0	16	1¾	14	33	**£2 1 0**	**1/3**	6
1	20	2	16	56	**£2 17 6**	**2/6**	14
2	45	2¼	18	90	**£3 9 6**	**3/9**	21
3	65	2½	20	125	**£4 10 0**	**5/6**	28
3A	75	2⅝	24	150	**£5 10 0**	**6/6**	31
4	90	2¾	24	170	**£6 11 9**	**7/6**	35
5	—	3	24	208	**£9 1 6**	**10/6**	44

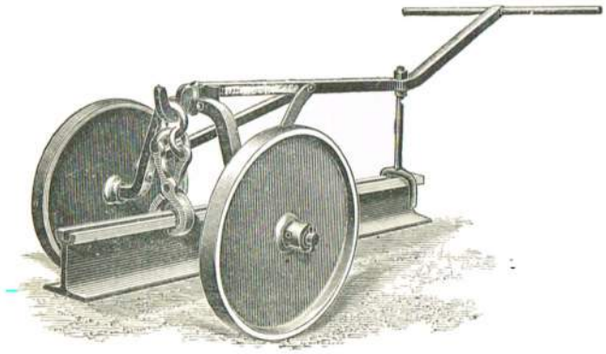

Fig. 1204. RAIL CARRIAGE.

With rail tongs, complete as shown.
Price, **£6 0 0**
Approximate weight, 2¾ cwts.

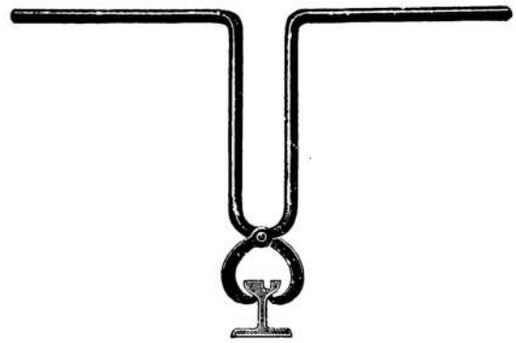

Fig. 1205. RAIL AND SLEEPER TONGS.

Rail Tong, as illustration, Price ... ... **17/6** each
Sleeper Tong, as illustration, Price ... .. 21/- each

Fig. 1206. ASH PLATELAYERS' LEVERS.

Length	6 ft.	Without ring or handle.	Weight approx.	21 lbs.	...	...	...	Price **£0 13 9** each.
„	7 ft.	„ „	„ „	30 lbs.	...	...	...	„ **£0 17 6** „
„	8 ft.	„ „	„ „	37 lbs.	...	...	...	„ **£1 0 6** „
„	10 ft.	with ring and handle.	Weight approx.	58 lbs.	...	...	...	„ **£1 11 0** „
„	12½ ft.	„ „	„ „	83 lbs.	...	...	...	„ **£2 0 0** „
„	15 ft.	„ „	„ „	...124 lbs.	...	...	...	„ **£2 11 0** „

ig. 1203A. JIM CROW for Tramway Rails, to bend rail as a lever.

aws to take in—	**Head**		**Flange**	
rew diameter... ...	2¾in.	2¾in.	2¾in.	2¾in.
pan between claws...	2ft. 6in.	3ft. 0in.	2ft. 6in.	3ft, 0in.
rice	**£6 12 6**	**£7 10 0**	**£6 17 6**	**£7 12 6**
pprox. Weights ...	180	195	200	223 lbs.

Lever Weight, 35lbs. Price **8/6** each.

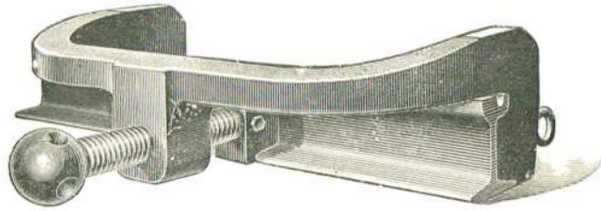

Fig. 1203B. JIM CROW to bend either head or flange of rail, with packing pieces to bend odd size rails.

Screw	3in. diam.
Span between claws	3ft. 6in.
Weight	448lbs.
Price	**£21 17 0**
Weight of Lever	48lbs.
Price of Lever	**£0 12 6**

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LIGHT RAIL TRACK.

Every description quoted for. Large stocks always on hand.

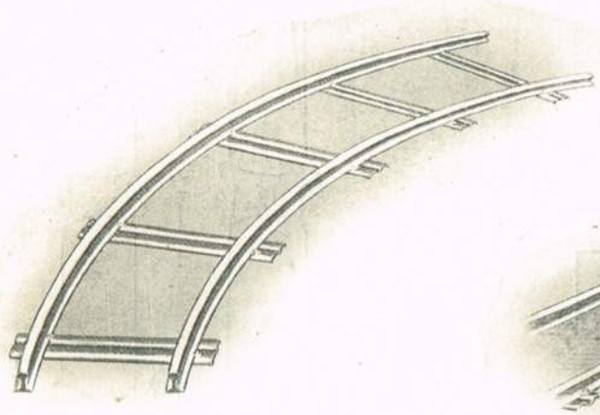


Fig. 1210. Curves.

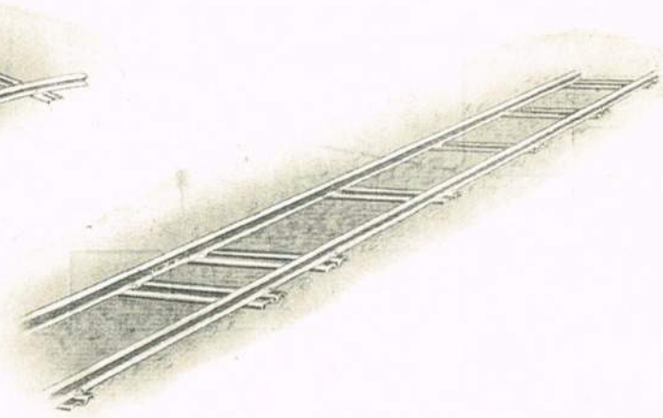
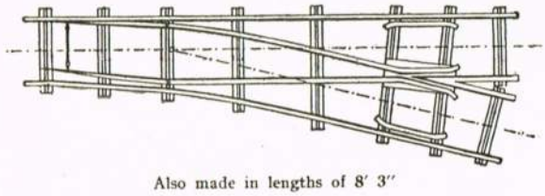


Fig. 1211. Straight Track.

(RIGHT HAND).



Also made in lengths of 8′ 3″

Fig. 1213.

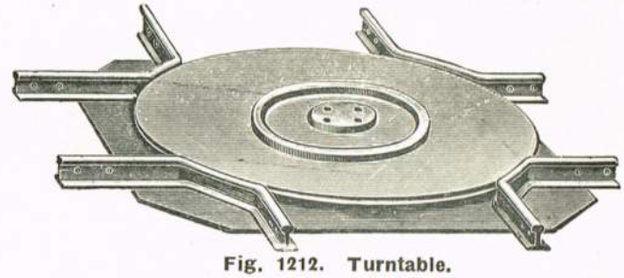


Fig. 1212. Turntable.

(LEFT HAND).

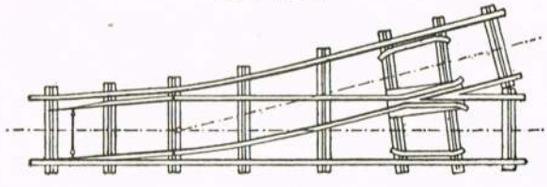


Fig. 1214.

(SYMMETRICAL)

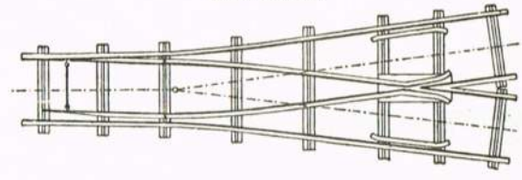


Fig. 1215.
POINTS AND CROSSINGS.

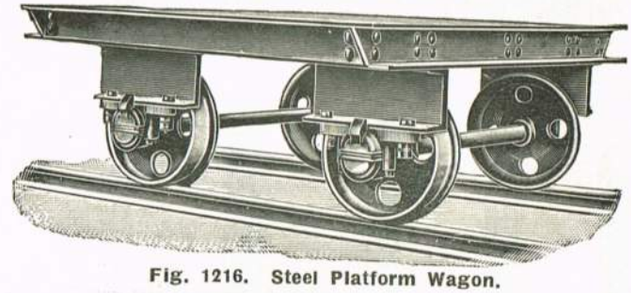


Fig. 1216. Steel Platform Wagon.

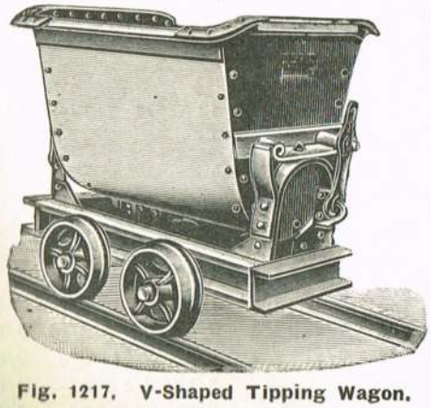


Fig. 1217. V-Shaped Tipping Wagon.

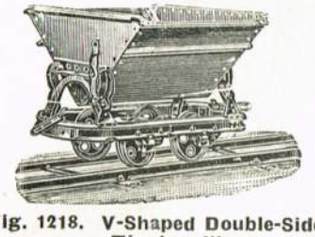


Fig. 1218. V-Shaped Double-Sided Tipping Wagon.

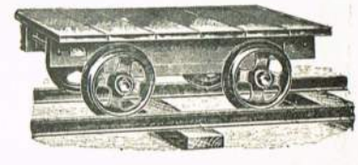


Fig. 1219. Wood Platform Wagon.

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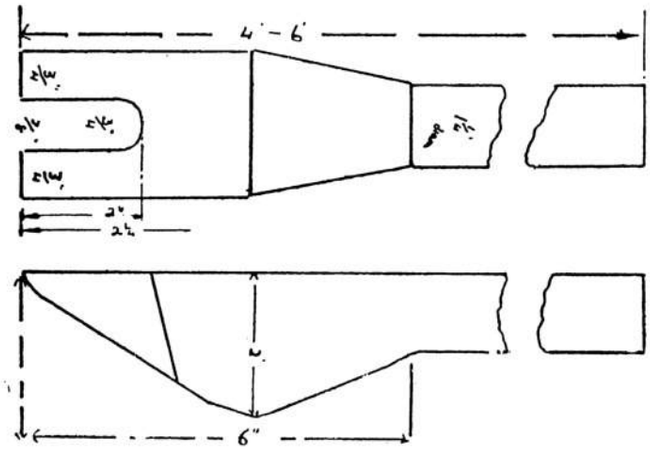
TUNNELLING TOOLS.

Made from High Grade Steel only. **All Tools Guaranteed.**



ig. 1220. Pig's Foot Bars, for lifting spikes and rails. Made from st quality wrought steel. All hand-made tools. Dimensions are stock s. Other sizes made to order. Weight approx., 20 lbs.
Price .... **1/2** per lb.

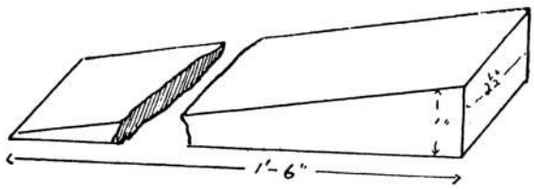


Fig. 1221. Timber Slice. Made from high-grade steel, carefully lened to withstand hardest wear. Made in any dimensions. The size vn is our stock size. Weight approx., 7 lbs.
Price **9d.** per lb.

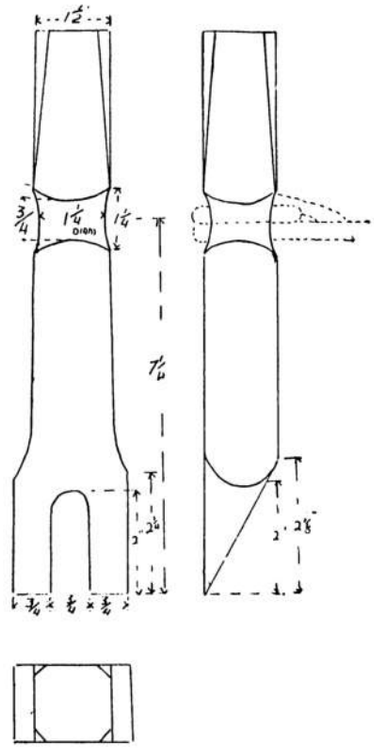


Fig. 1222. Pig's Foot Cold Sets, with iron wire rod, for use in conjunction with sledge hammer. Will remove rusted dog spikes easily. Finest materials only used in their manufacture. Other sizes made to order. Weight approx., 5 lbs.
Price .... **1/4** per lb.

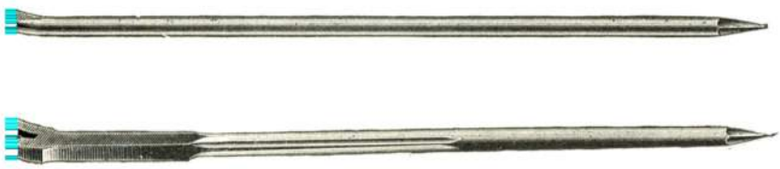
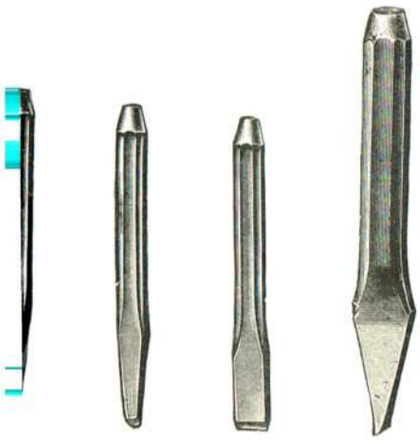


Fig. 1223. Best Quality Chisel and Point Crow Bars. Any weight and dimensions made to order. Large stocks of useful sizes.
Price .... **6d.** per lb.
Stock size, 5 ft. Weight, 15 lbs.

Fig. 1224. Best Quality Claw Bars.
Any size made to order.
Price .... **6d.** per lb.
Stock size, 6 ft. Weight, 24 lbs.



1225. Fig. 1226. Fig. 1227. Fig. 1228.
ıond. Half-round. Flat. Cross-cut.

COLD CHISELS.

We manufacture our chisels from the finest steel only, which are therefore fully guaranteed against defective material. Those listed below are stock sizes, but we shall be pleased to manufacture special sizes to order. We can also make them in round, flat or square if desired.

Size of Steel.	Length, inches : 4	5	6	7	8	9	10	12	14	16	18	24
¼	-/5	—	—	—	—	—	—	—	—	—	—	—
5/16	-/5	-/5½	—	—	—	—			—	—	—	—
⅜	-/5½	-/6	-/6½		—	—	—	—	—	—	—	—
7/16	-/6	-/6½	-/7	—	—	—	—	—	—	—	—	—
½	—	-/7	-/7½	-/8	-/8½	—	—	—	—	—	—	—
⅝	—	—	-/10	-/10½	-/11	1/-	1/1	1/3	1/5	—	—	—
¾	—	—	—	1/1	1/2	1/3	1/5	1/9	2/-	2/4	2/7	3/6
⅞	—	—	—	—	1/5	1/6	1/8	2/1	2/6	2/10	3/2	4/3
1	—	—	—	—	1/9	1/11	2/1	2/6	2/11	3/3	3/8	4/10
1⅛	—	—	—	—	—	—	—	3/1	3/8	4/-	4/5	5/9
1¼	—	—	—	—	—	—	—	3/10	4/6	5/-	5/6	7/-

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TUNNELLING TOOLS.

ALL THESE TOOLS ARE MADE FROM HIGHEST GRADE STEEL AND ARE GUARANTEED BY US.

Fig. 1229. Barrel Punch.

Fig. 1230. Straight and Taper Punch.

Fig. 1231. Taper, Straight Taper Punch.

Fig. 1232. Taper Punch.

Fig. 1233. Double Taper Punch.

We make large quantities of these Punches or Bodgers, and hold large stocks of Punches from 6″ to 9″ in length, of various designs, as shown. They are made from best wrought steel, and can be had hardened or annealed, which please state when ordering.

Price .... **1**/– per lb.

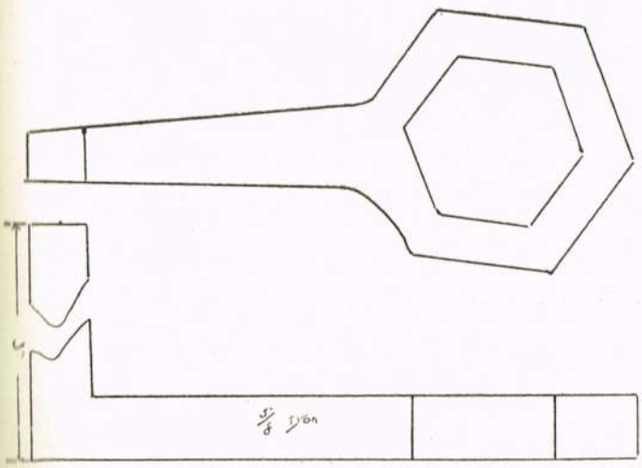

Fig. 1234. **" Odd Man " or Ring Spanner,** with foot end. Used by railway and constructional engineers. By placing this on the head of the bolt, the foot strikes the rail, leaving both hands free to exert full pressure on stubborn nuts. One man only required for the job.

Sizes, inches	½	⅝	¾	⅞	1	1⅛	1¼
Price each	**3/9**	**4/6**	**5/3**	**6/-**	**6/9**	**7/9**	**8/3**

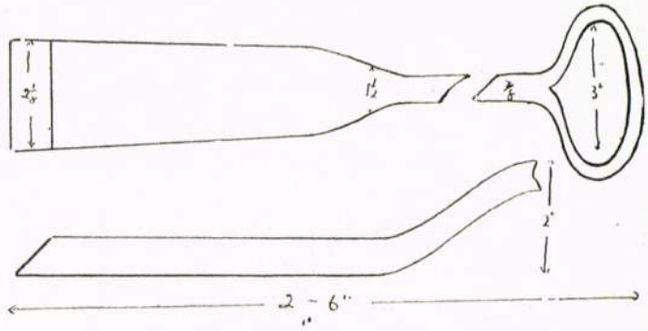

Fig. 1235. **Clay Slice,** for removing clay and finishing off, prior to fitting in segments or brick work. The dimensions given are stock sizes. Other sizes made to order. Weight approx., 5 lbs

Price ... **9d.** per lb.

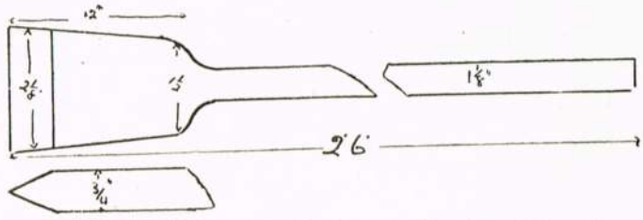

Fig. 1236. **Timbermen's Wedge or Slice,** for slitting heavy timbers. Dimensions given are stock sizes. Other sizes made to order. Weight approx., 12 lbs.

Price ... **9d.** per lb.

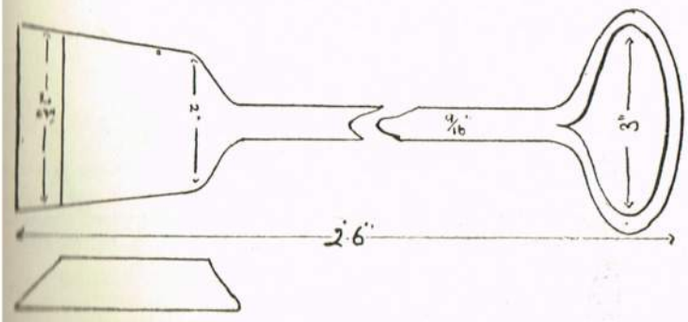

Fig. 1237. **Special Cleaning Tool or Scraper,** for removing clay and scale from ironwork. Dimensions given are stock sizes. Other sizes made to order. Weight approx., 4 lbs.

Price ... **9d.** per lb.

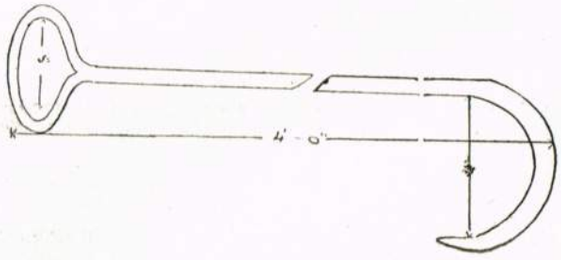

Fig. 1238. **Tunnel Segment Lifting Hook.** Made from wrought steel. Dimensions given are stock sizes. Other sizes made to order. Weight approx., 6 lbs.

Price .... **6d.** per lb.

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HAMMERS.

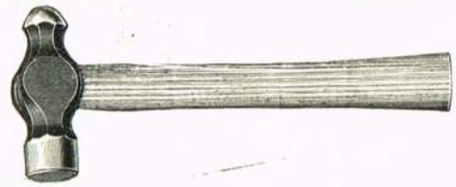

Fig. 1240. Best Cast Steel Engineers' Hammer Heads. Ball, Cross and **Straight** Pane, fitted with plain ash handles.

Approx. weight, ozs.	2	4	6	8	10	12	14	16	18	
Price per dozen, Ball and Cross Pane	**16/6**	**16/6**	**16/6**	**16/6**	**16/6**	**16/6**	**16/6**	**17/6**	**19/6**	
Price per dozen, Straight Pane	**18/6**	**18/6**	**18/6**	**18/6**	**18/6**	**18/6**	**18/6**	**19/6**	**21/6**	
Approx. weight, lbs.	1¼	1½	1¾	2	2¼	2½	2¾	3	3½	4
Price per dozen, Ball and Cross Pane	**21/6**	**24/–**	**27/–**	**31/–**	**35/–**	**37/6**	**39/–**	**43/6**	**51/–**	**56/–**
Price per dozen, Striaght Pane	**23/2**	**26/9**	**30/6**	**35/–**	**38/9**	**42/3**	**45/–**	**49/6**	**56/6**	**64/–**

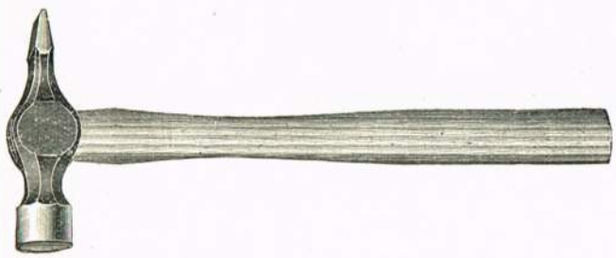

Fig. 1241. Solid Steel Warrington or Joiner's Hammer.
Handled with selected oval ash polished handles.

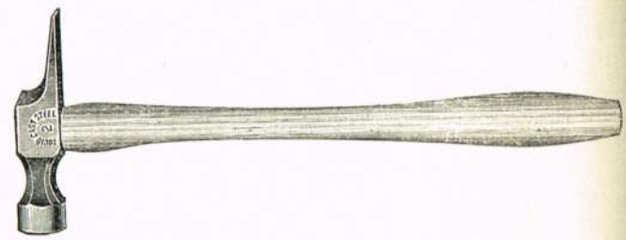

Fig. 1242. Solid Steel Exeter or Rivetting Hammer.
Handled with best quality oval ash handles.

Fig. 1241. Size	0000	000	00	0	1	2	3	4	5	6	7	8	9	10	12	
Approx. weight, ozs.	4	5	6	8	10	12	14	16	18	20	22	25	28	31	33	
Price per dozen	**12/6**	**13/–**	**13/6**	**14/–**	**15/–**	**16/–**	**18/–**	**21/–**	**25/–**	**29/–**	**32/–**	**38/–**	**44/–**	**50/–**	**56/–**	
Fig. 1242. Size	0000	000	00	0	1	2	3	4	5	6	7	8	9	10		
Price per dozen	**12/6**	**13/–**	**13/6**	**14/–**	**15/–**	**16/–**	**18/–**	**21/–**	**25/–**	**29/–**	**32/–**	**38/–**	**44/–**	**50/–**		

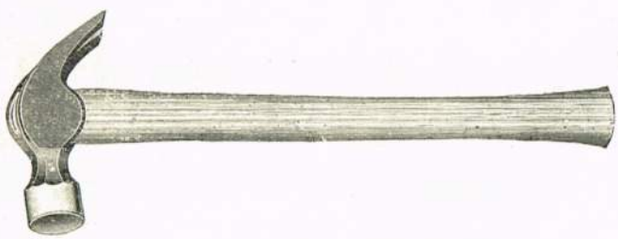

Fig. 1243. Solid Steel Claw Hammer.
With polished plain oval ash handles.

Size	0000	00	0	1	2	3	4	5	6
Approx. weight ozs.	5	8	12	14	16	20	24	28	32
Price per doz.	**18/–**	**19/–**	**20/–**	**23/–**	**26/–**	**30/–**	**36/–**	**50/–**	**60/–**

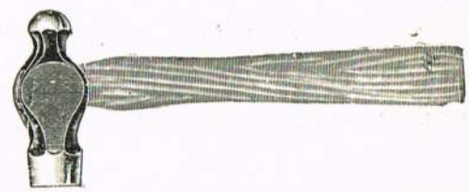

Fig. 1244. Solid Steel Motor Mechanics' Ball Pane Hammer.
With short polished ash oval handles.

Weight		Handle length inches		Price per doz.
12 ozs.	....	9	....	**16/6**
16 ozs.	....	10	....	**17/6**
16 ozs.	....	12	....	**17/6**

Fig. 1245. Solid Steel Engineers' Ball Pane Pin Hammer.
Handled with best polished oval ash handles.
Approx. weight, 3 oz. head. Price .... **18/–** doz.

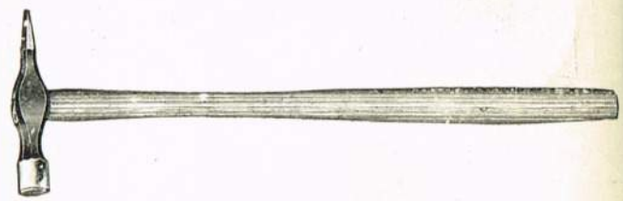

Fig. 1246. Solid Steel Mechanics' Cross Pane Pin Hammer.
Handled with best polished oval ash handles.
Approx. weight, 4 oz. head. Price .... **18/–** doz.

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HAMMERS.

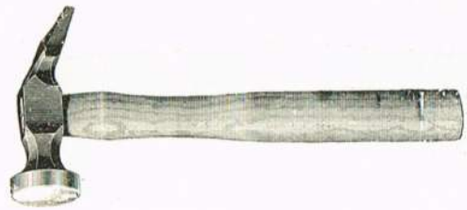

Fig. 1247. Solid Steel Shoemaker's Hammer, with best polished oval handles.
Price .... **22**/– per dozen.

Fig. 1249. " Diamond."

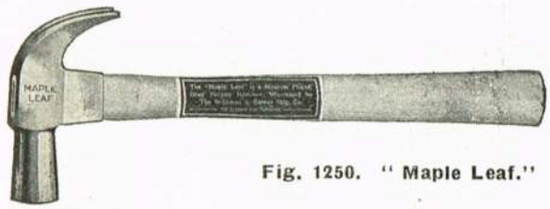

Fig. 1250. " Maple Leaf."

Fig. 1251. " Garden City."

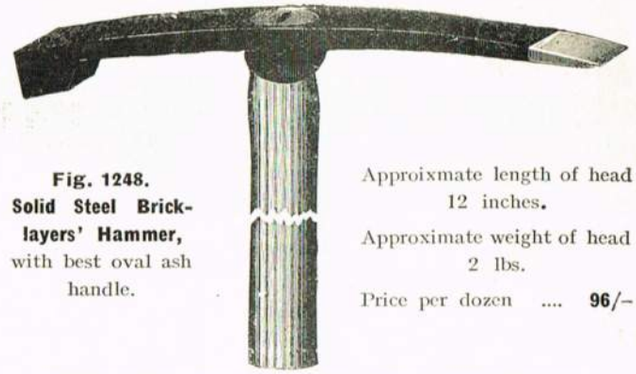

Fig. 1248.
Solid Steel Bricklayers' Hammer, with best oval ash handle.

Approixmate length of head 12 inches.

Approximate weight of head 2 lbs.

Price per dozen **96**/–

Williams' Drop-Forged Adze Eye Pattern Claw Hammers.

These hammers are drop forged from a specially selected grade of steel, then heat-treated and carefully hardened and drawn to the proper temper. The handles are second growth, straight grain, air-dried, white hickory, with a flare at the grip which prevents hand-slip; they are wax-finished and retain the natural colour of the wood. Special steel wedges absolutely keep the handles from working loose.

	No.	Weight of hammer lbs.	ozs.	Price per dozen £	s.	d.
Fig. 1249.	1	1	8	**6**	**14**	**2**
	1A	1	4	**5**	**15**	**0**
	1B	1	0	**5**	**9**	**10**
	1C	0	13	**5**	**4**	**7**
	1D	0	7	**5**	**0**	**5**
Fig. 1250.	132D	1	8	**5**	**11**	**1**
	132	1	4	**5**	**1**	**6**
	132A	1	0	**4**	**11**	**11**
	132B	0	13	**4**	**7**	**1**
	132C	0	7	**4**	**3**	**4**
Fig. 1251.	32D	1	8	**4**	**3**	**4**
	32A	1	4	**3**	**17**	**1**
	32	1	0	**3**	**11**	**11**
	32B	0	13	**3**	**8**	**9**
	32C	0	7	**3**	**5**	**8**

The weight of each hammer does not include the handle.

Fig. 1252.
Solid Steel Engineer's Hammer, Ball Pane.
Approx. weight, 2ozs., 4ozs., 6ozs.

Fig. 1253.
Solid Steel Engineer's Hammer, Cross Pane.
8ozs., 10ozs., 12zs., 14zs., 16ozs., 18ozs., 1¼lb., 1½lb.

Fig. 1254.
Solid Steel Engineer's Hammer, Straight Pane.
1¾lbs., 2lbs., 2¼lbs., 2½lbs., 2¾lbs., 3lbs., 3½lbs., 4lbs.

Price for **Fig. 1252 and Fig. 1253.** For 1lb. and upwards, **1/0½** per lb.; under 1 lb., **12/6** per doz.
Price for Fig. 1254. (Straight pane). For 1lb. and upwards, **1/2½** per lb.; under 1lb., **14/6** per doz.

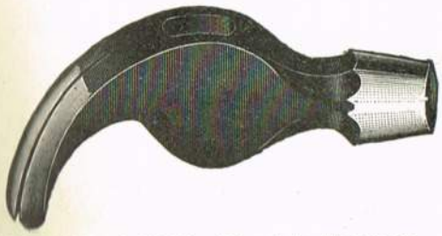

Fig. 1255. Solid Steel Farrier's Hammers.

Size	1	2	3	4
Approx. weight ozs.	9	12	14	16
Price— Heads only doz.	**24**/–	**26**/–	**28**/–	**32**/–
Handled, doz.	**31**/–	**33**/–	**35**/–	**39**/–

Fig. 1256. Solid Steel Scaling Hammers.

Size	1	2	3	4
Approx. weight, lbs.	¾	1	1¼	1½
Price— Heads only doz.	**11**/–	**11**/–	**14**/–	**16**/**6**
Handled, doz.	**15**/–	**15**/–	**18**/–	**20**/**6**

Fig. 1257. Solid Steel Mason's Hammers.

Size	1	2	3	4	5	6
Approx. weight, lbs.	2	2½	3	3½	4	5
Price— Heads only, doz.	**20**/–	**25**/–	**30**/–	**35**/–	**40**/–	**50**/–
Handled doz.	**26**/–	**31**/–	**36**/–	**41**/–	**46**/–	**56**/–

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HAMMERS.

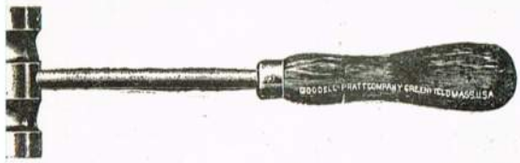

Fig. 1260.

(No. 91/4.) BRASS HAMMERS.

No.		Weight ozs.	Head inches	Price each
1	....	2	$1\frac{1}{2} \times \frac{1}{2}$	**2/6**
2	....	4	$1\frac{3}{4} \times {}^{9}/_{16}$	**3/4**
3	....	8	$2\frac{1}{4} \times \frac{3}{4}$	**4/2**
4	....	16	3×1	**6/8**

Fig. 1261.

CAST STEEL MILL BILLS.

With or without eyes.

Price .... **1/6** per lb.

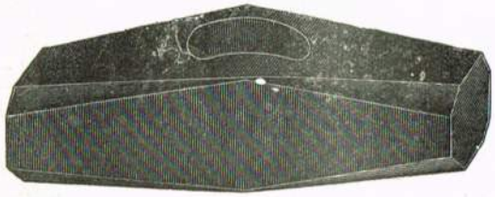

Fig. 1262.

MASONS' PUNCH HAMMER.

Price .... **9d.** per lb.

Fig. 1263.

SPALLING HAMMER.

Price .... **9d.** per lb.

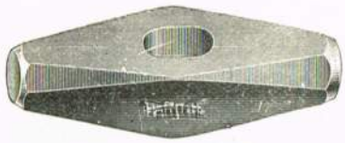

Fig. 1264.

STONEBREAKING HAMMER.

Price .... **9d.** per lb.

Fig. 1265.

QUARRY HAMMERS.

Price .... **9d.** per lb.

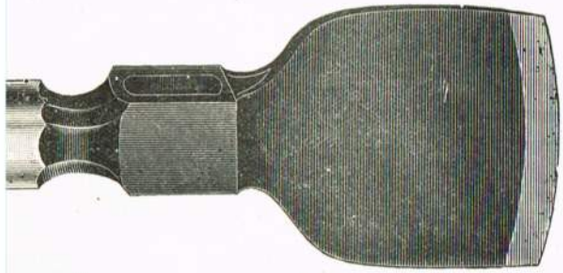

Fig. 1266.

SCAFFOLDING HAMMER.

Handled.

Weight, lbs.	....	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
Price each	....	**5/10**	**6/4**	**6/10**	**7/4**

Fig. 1267.

CHIPPING HAMMERS.

1 lb. and upwards .... **9d.** per lb.

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HAMMERS.

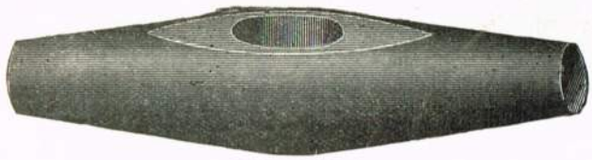

Fig. 1268.
BOILER-MAKERS' HOLDING-ON HAMMERS.
Price .... **9d.** per lb.
Unde 1 lb. charged as 1 lb.

Fig. 1269.
BOILER-MAKERS' HAMMERS.
Price .... **1/–** per lb.
Under 1 lb. charged as 1 lb.

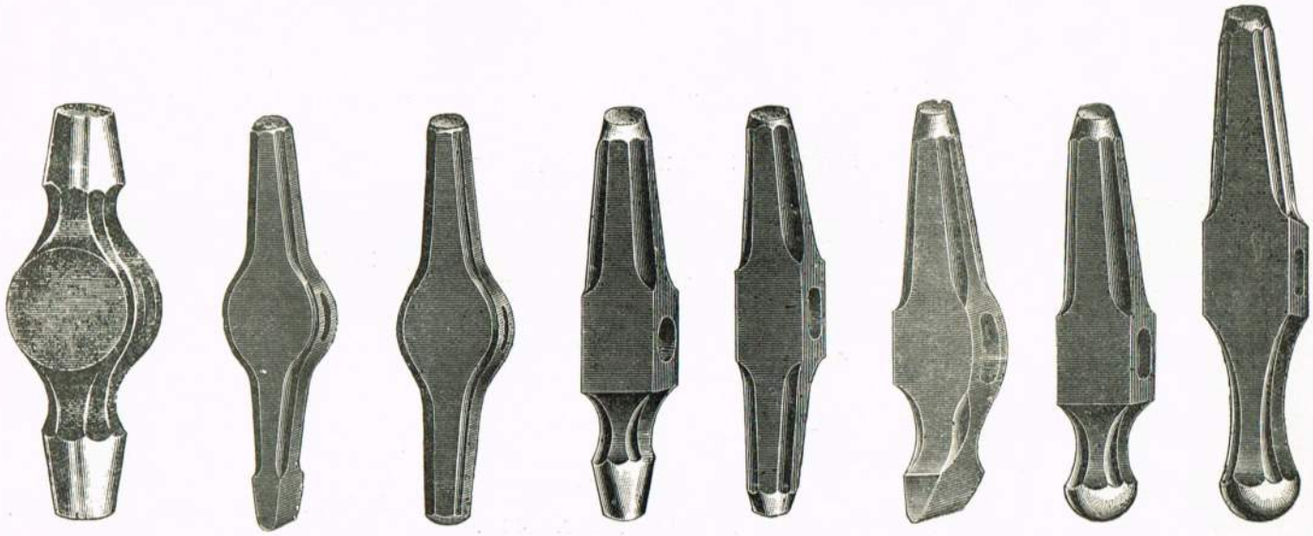

Fig. 1270. Fig. 1271. Fig. 1272. Fig. 1273. Fig. 1274. Fig. 1275. Fig. 1276. Fig. 1277.

BOILER-MAKERS' HAMMERS. **1/-** per lb.
Under 1 lb. charged as 1 lb.
All the above usually stocked 2 to 4 lbs.

Fig. 1278.
PLATELAYERS' SPIKING HAMMERS.
6 lbs. and up.
6d. lb.

Fig. 1279.
PLATELAYERS' STRAIGHT KEYING HAMMER.
6 lbs. and up.
6d. lb.

Fig. 1280.
PLATELAYERS' CRANKED KEYING HAMMER.
6 lbs. and up.
6d. lb.

Fig. 1281.
BOILER SCALING HAMMERS.
Made in $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, lbs.
Price .... **1/-** per lb.

Fig. 1282.
SHIPWRIGHTS' PIN MAULS.
Price .... **1/-** per lb.

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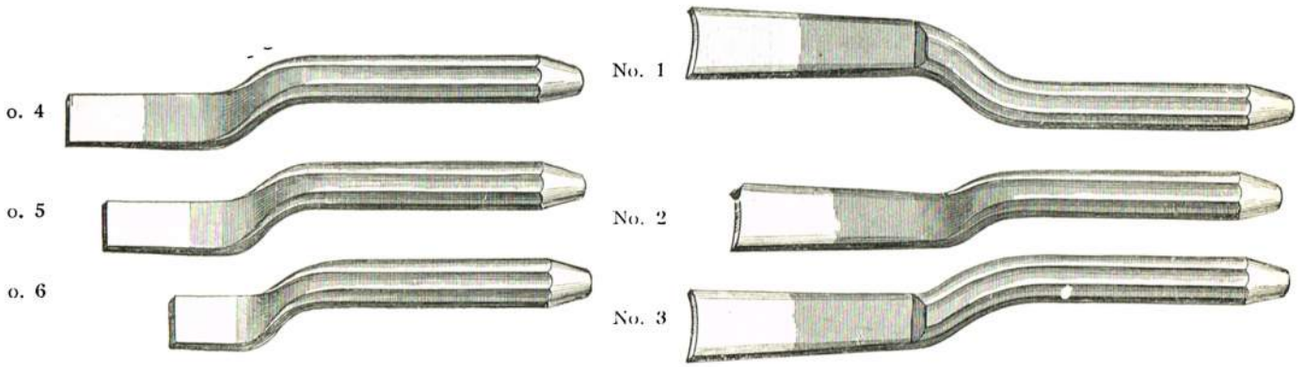
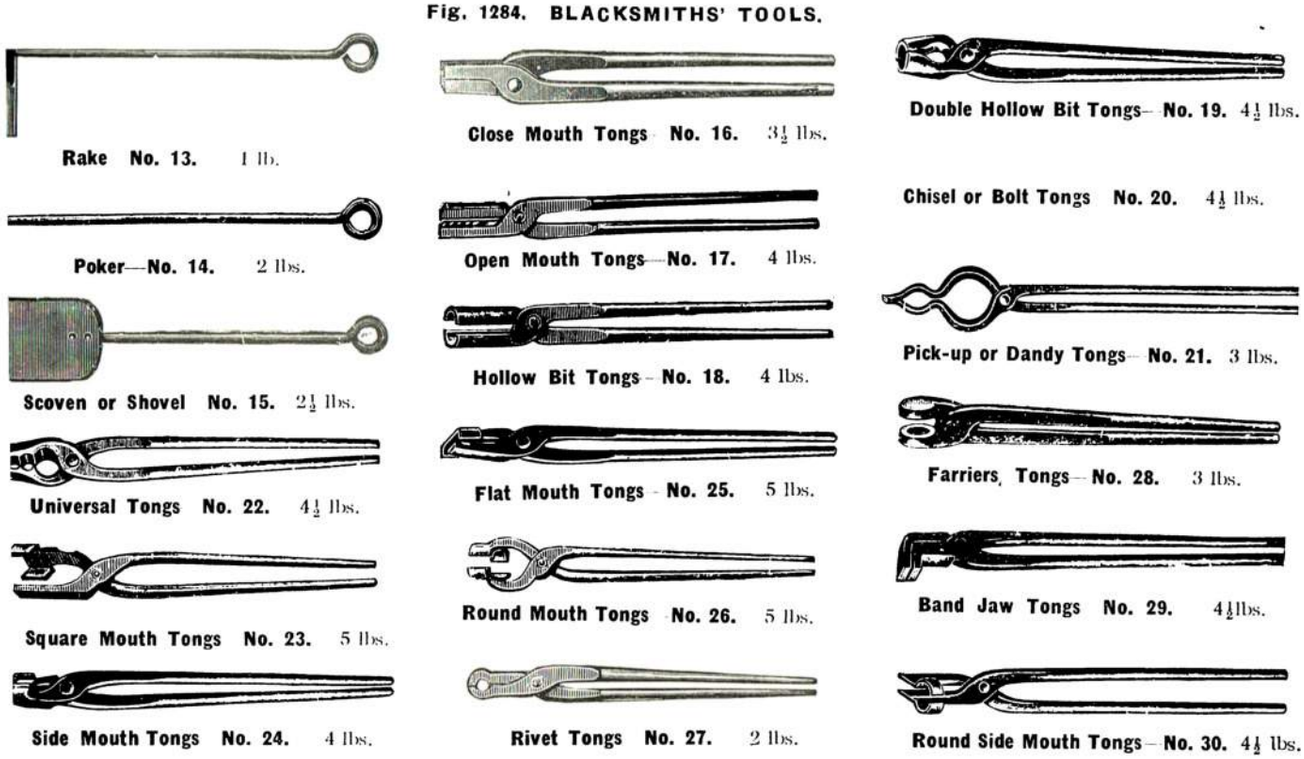
CAULKING & SMITH'S TOOLS.

Fig. 1283. BEST HAND-WROUGHT CAULKING TOOLS.



These Caulking Tools for gas and water mains are manufactured from finest materials, and are fully guaranteed. All types and sizes. Price ... **1/6** per lb. Other types and sizes to order.

Fig. 1284. BLACKSMITHS' TOOLS.



All prices of Tongs **1/-** per lb. **Nos. 13, 14 and 15** **5/6** per set.

ig. 1285. Double-Faced Wrought Steel Sledge Hammers.
Made in 4, 5, 6, 8, 10, 12, 14, 28 lbs.
Price ... **4½d.** per lb.

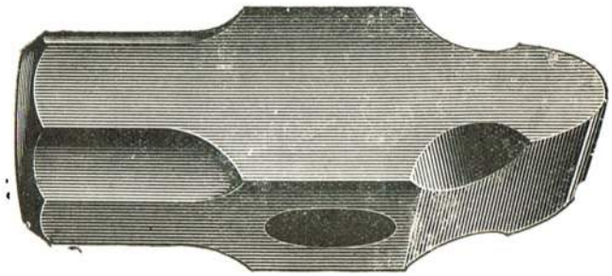


Fig. 1286. Cross Pane Wrought Steel Hammer.
Made in 6, 8, 10, 12, 14 lbs.
Price ... ... **5½d.** per lb.

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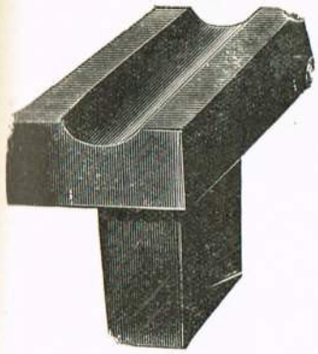
SMITHS' TOOLS.

Fig. 1287.



No. 2. Bottom Swage.
Price ... **1**/- per lb.

No. 3. Top Swage.
Price ... **1**/- per lb.

No. 4. Bottom Fuller.
Price ... **1**/- per lb.

No. 8. Top Fuller.
Price ... **1**/- per lb.

No. 5. Set Hammer.
Price ... **1**/- per lb.

No. 6. Flattener.
Price ... **1**/- per lb.

No. 7. Hardie.
Price ... **1**/- per lb.

No. 12. Boiler Snap.
Price ... **1/4** per lb.

No. 11. Cold Set.
Price ... **1**/- per lb.

No. 10. Hot Set.
Price ... **1**/- per lb.

No. 9. Cold Set with Eye.
Price ... **1**/- per lb.

AVERAGE WEIGHTS.

Swages and Fullers—$\frac{1}{2}''$ to $1''$, 6 lbs. per pair; $1\frac{1}{8}''$ to $1\frac{1}{2}''$, 7 lbs. to 8 lbs. per pair; $1\frac{5}{8}''$ to $2''$, $8\frac{1}{2}$ lbs. to $9\frac{1}{2}$ lbs. per pair.
Hot and Cold Sets—$1\frac{1}{2}''$ to $1\frac{3}{4}''$, $3\frac{1}{2}$ lbs. to $5\frac{1}{2}$ lbs. each.
Flatterners—$2''$, $3\frac{1}{2}$ lbs.; $2\frac{1}{2}''$, 4 lbs.; $3''$, 5 lbs. each.
All Top Tools, Sets and Snaps are supplied with iron rods unless otherwise ordered. Bottom tools are stocked with $1''$ and $1\frac{1}{8}''$ square shanks. Every kind of Wrought Iron Tools made and worked from specification.

Fig. 1288. RAIL GAUGES.

4 ft. $8\frac{1}{2}$ ins. ... **12**/- each.

Any gauge made to order.

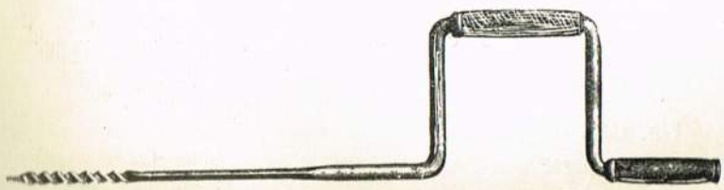


Fig. 1289. PLATELAYERS' AUGERS.

Size, inches ...	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price each ...	**10/6**	**10/6**	**11/6**	**14/6**	**21/-**

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HAMMERS, Etc.

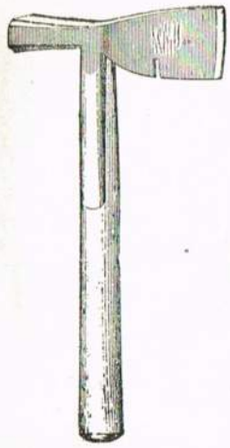

Fig. 1290.

Lath Hammer.

Price .... **45**/– per dozen.

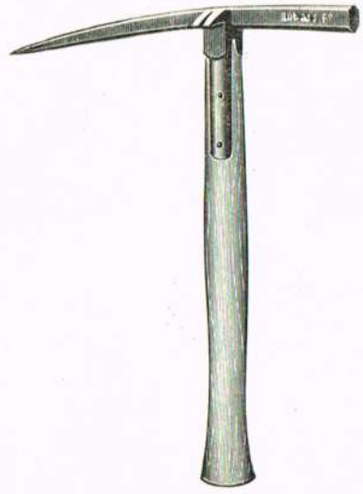

Fig. 1291.

Slaters' Hammer.

Price .... **79**/– per dozen.

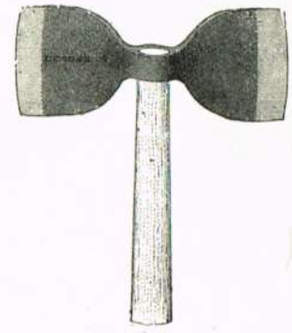

Fig. 1292.

Brick Dresser.

Price .... **45**/– per dozen.

Fig. 1293.

Packing Case Opener.

16″ long.

Price .... **61**/– per dozen.

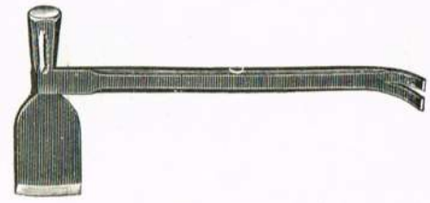

Fig. 1294.

Grocers' Hammer.

Price .... **55**/– per dozen.

Fig. 1295.

Kent Bill Hooks.

ze, inches	....	8	9	10
ice per dozen	....	**42**/–	**45**/–	**48**/–

Fig. 1296.

Slaters' Axe.

Price .... **69**/– per doze ı.

Fig. 1297.

Slaters' Rippers.

Price .... **57**/– per dozen.

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ADZES, TROWELS, Etc.

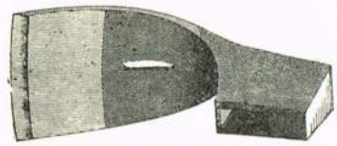

Fig. 1298. PLATELAYERS' ADZE.

Flat head. Bright and blued.

Size, ...	1	2	3
Price per doz.	**147/–**	**154/–**	**160/–**

Fig. 1299. CARPENTERS' ADZE.

Size ...	1	2	3
Price per doz.	**70/6**	**75/6**	**82/–**

Fig. 1300. SHIP ADZE.

Size	1	2	3
Price per doz.	**80/6**	**87/6**	**95/–**

Fig. 1301. CARPENTERS' ADZE.

Size	000	00	0	1	2
Size of blade, inches	$5\frac{1}{8}\times3$	$5\frac{1}{4}\times3\frac{1}{8}$	$5\frac{1}{2}\times3\frac{1}{4}$	$5\frac{3}{4}\times3\frac{3}{8}$	$6\times3\frac{1}{2}$
Price per dozen ...	**76/–**	**83/6**	**91/–**	**97/–**	**106/–**

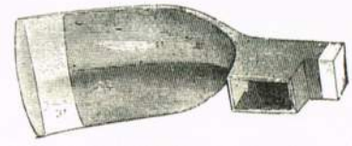

Fig. 1302. WHEELERS' ADZE.

Size	1	2	3
Price per dozen	**85/–**	**89/–**	**93/–**

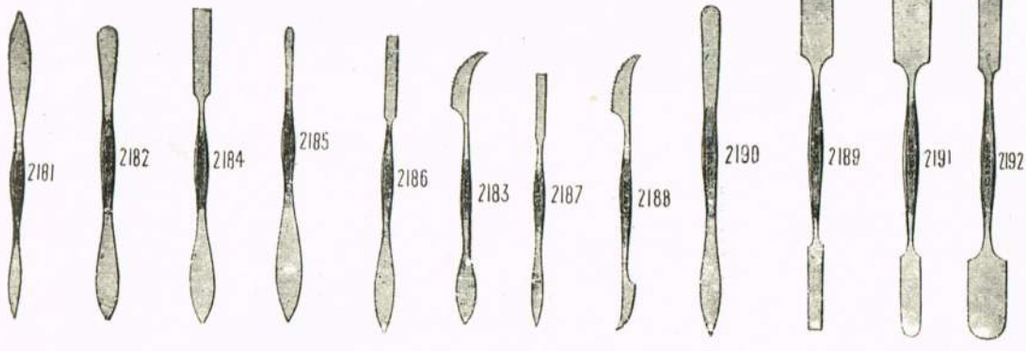

Fig. 1303. PLASTERERS' TOOLS in Sets of Twelve.

34/– per dozen.

Fig. 1304.
LINE PINS.
Bright steel.
Per **12/6** doz.

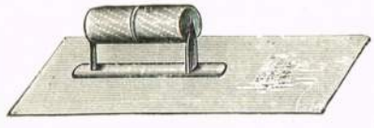

Fig. 1305. PLASTERING TROWEL.
Double Tang.

Size, inches	11
Price per dozen ...	**73/–**

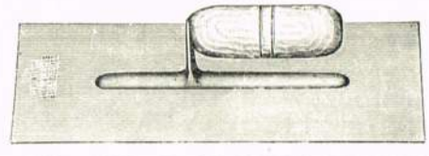

Fig. 1306. PLASTERING TROWEL.
Single Tang.

Size, inches	11
Price per dozen	**60/6**

Fig. 1307. POINTING TROWELS.

Size, inches ...	3	4	5
Price per dozen	**20/–**	**22/6**	**25/6**
Size, inches ...	6	7	8
Price per dozen	**28/–**	**32/–**	**36/–**

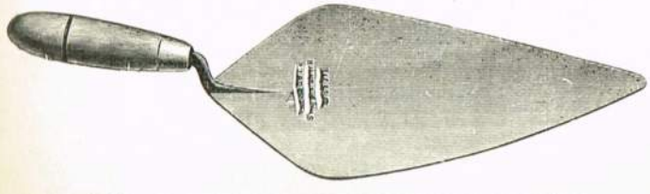

Fig. 1308. LONDON SINGLE-FERRULE TROWEL.

Warranted.

Size, inches	10	$10\frac{1}{2}$	11	12	13
Price per dozen ...	**72/–**	**74/–**	**76/6**	**81/6**	**86/6**

Fig. 1309. GAUGING TROWEL.

Size, inches ...	6	7	8	9	10
Price per dozen ...	**49/6**	**53/6**	**57/6**	**60/6**	**67/6**

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HANDLES, MALLETS, Etc.

Fig. 1320. BENT TAPERED SHOVEL HANDLES.

28″ long. Rivetted D handles.

Price ... **27/–** per dozen.

Fig. 1322. BENT SHOVEL HANDLES.

30″ long. Rivetted D handles.

Price ... **31/6** per dozen.

g. 1324. STRAIGHT TAPERED SHOVEL HANDLES.

28″ long. Rivetted D handle.

Price ... **29/6** per dozen.

Fig. 1326. ENGINEERS' HAMMER HANDLES.

, inches ...	12	14	16	18	20	22	24
kory, per dozen	**4/6**	**6/–**	**7/–**	**8/–**	**9/–**	**11/–**	**14/–**
, per dozen	**2/4**	**2/8**	**3/–**	**3/6**	**5/–**	**6/–**	—

Fig. 1328. CARPENTERS' HAMMER HANDLES.

, inches ...	10	11	12	13	14	16	18
kory, per dozen	**3/6**	—	**4/6**	—	**6/–**	**7/–**	**8/–**
, per dozen	**2/–**	**2/2**	**2/4**	**2/6**	**2/8**	**3/–**	**3/6**

Fig. 1329 TINMEN'S MALLETS.

, inches ...	2	2¼	2½	2¾	3	3½
ch, per dozen ...	**15/–**	—	**17/–**	**19/–**	**21/–**	—
num vitæ, per dozen	**21/–**	**24/–**	**26/–**	**36/–**	**42/–**	**50/–**

Fig. 1321. NAVVIES' PICK HANDLES.

Size, inches	30	36	42
First Quality Hickory, per dozen ...	**20/–**	**23/–**	**30/–**
Second Quality Hickory, per dozen ...	**15/–**	**18/6**	**28/–**
First Quality Ash, per dozen ...	**10/–**	**13/6**	**15/–**

Fig. 1323. SLEDGE HAMMER HANDLES.

Size, inches	30	36	42
First Quality Hickory, per dozen ...	**20/–**	**23/–**	**30/–**
Second Quality Hickory, per dozen ...	**15/–**	**18/6**	**28/–**
First Quality Ash, per dozen	**10/–**	**13/6**	**15/–**

Fig. 1325. ASH BROOM AND RAKE HANDLES.

Size, inches	72	84	96
Best Ash, 1¼″ diam., per dozen ...	**33/–**	**48/–**	**70/–**
,, ,, 1¾″ ,, ,, ...	**40/–**	**54/–**	**80/–**

Fig. 1327. KENT FELLING AXE HANDLES.

Size, inches	30	36
Hickory, best, per dozen	**30/–**	**32/–**
,, second ,, ...	**21/–**	**23/–**

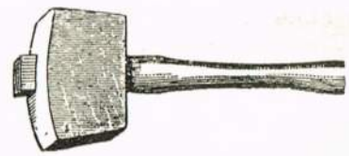

Fig. 1329. CARPENTERS' BEST MORTICED BEECH MALLETS.

Size, inches ...	4	4½	5	6	7
Price per dozen ...	**26/–**	**28/–**	**32/–**	**44/–**	**56/–**

Fig. 1330. BOSSING MALLET.

Lignum Vitæ and Boxwood.

Size, inches ...	1½	1¾	2	2¼	2½	2¾	3
Price per dozen	**24/–**	**24/–**	**24/–**	**27/–**	**30/–**	**40/–**	**48/–**

Fig. 1331. STONELAYERS' MAULS AND 5-FT. HANDLES.

Price each ... 12″×7″, **9/6**. 14″×8″, **12/–**;. 15″×9″, **14/6**.

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PLUMBERS' TOOLS, Etc.

Fig. 1340. Masons' Mallets.

Size, inches ...	6	7	8
Price per dozen	**86/–**	**140/–**	**160/–**

Fig. 1341. Chase Wedges.
With iron ferrule.

Size, inches	2	2½	2¾	3
Price per doz.	**14/–**	**20/–**	**23/–**	**27/–**

Long.
Fig. 1342.

Short.
Fig. 1343

Chalk Line Reels.

Beech, waxed, **9/–** dozen.

Beech, waxed, **6/6** dozen.

Fig. 1344. Bending Stick.
Boxwood.
44/– per dozen.

Fig. 1345. Setting-up Stick.
Boxwood.
44/– per dozen.

Fig. 1346. Bossing Stick.
44/– per dozen.

Fig. 1347. Mitre Box.

9″×3″ ...	**28/–**	per doz.
12″×3″ ...	**44/–**	,,

Fig. 1348. Lead Dressers.

Face, inches ...	6×1½	7×2	7½×2¼	8×2½	8½×2¾
Price, each ...	**2/6**	**4/–**	**5/–**	**6/6**	**7/6**

Fig. 1349. Vice Clamps.

Size, inches ...	2	2½	3	3½	4
Price per dozen ...	**10/–**	**13/–**	**15/–**	**21/–**	**30/–**

Fig. 1350. Turnpins.

Size, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3
Price per doz.	**4/–**	**4/6**	**5/–**	**6/6**	**9/–**	**13/6**	**16/6**	**20/–**	**26/–**

Fig. 1357. Bobbins.

Size, inches ...	1	1¼	1½	1¾	2	2½	3	3½	4
Price per doz.	**4/–**	**4/6**	**5/–**	**7/–**	**9/–**	**16/6**	**26/–**	**40/–**	**54/–**

Fig. 1352. Rail Spikes.
With or without ears.

Size, in.	2½×5/16	3×⅜	3½×½	4×½	4×⅝	5×⅝
Price per cwt.	**56/–**	**47/–**	**41/–**	**38/6**	**35/–**	**35/–**

Fig. 1353. Timber Spikes.
Flat or Rose Head.

Size ins.	3	4	5	6	7	8	10
Price per cwt.	**50/-**	**43/-**	**39/-**	**36/-**	**34/6**	**32/6**	**32/6**

Fig. 1354. Screwed Shackles.

Size, ins.	¼	5/16	⅜	7/16	½	9/16
Per gross	**30/-**	**54/6**	**61/6**	**83/-**	**90/6**	**112/–**

Size, ins.	⅝	¾	⅞	1
Per gross	**76/–**	**70/–**	**70/–**	**70/–**

Fig. 1355.

8″	10″	12″	14″

all **21/–** per cwt.

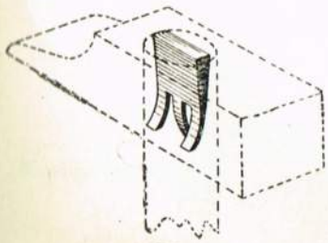

Fig. 1356. "ITISA" HAMMER WEDGES.

Sizes	00	0	1	2	3	4	5	6
Price per gross ...	**5/–**	**6/6**	**8/6**	**10/6**	**13/–**	**15/6**	**18/6**	**21/–**

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AXES. SCRAPERS.

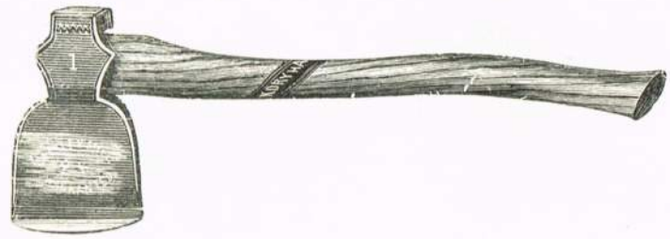

Fig. 1357. KENT AXES, handled, for Contractors' use. Best Quality.

Size weight, lbs.	2	2½	3	3½	4	4½	5	5½	6	7
Price per doz.	**72/-**	**82/-**	**94/-**	**106/-**	**122/-**	**136/-**	**154/-**	**168/-**	**186/-**	**244/-**

Fig. 1358. YANKEE FELLING AXES. Handled. Best Quality.

4 lb. ... **82/6** doz. 4½ lb. ... **89/-** doz. 5 lb. ... **95/6** doz.

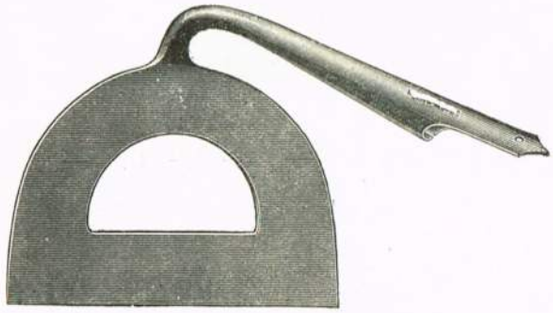

Fig. 1359. MORTAR LARRIE.
Price, **43/6** per dozen.

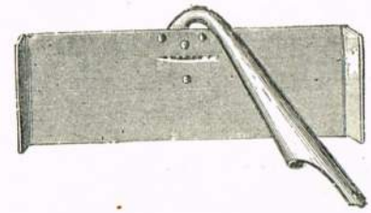

Fig. 1360. ROAD SCRAPERS, Solid.

Size, inches ...	12	14	16	18
Price, dozen ...	**33/-**	**37/-**	**41/-**	**45/-**

Above Handled, **24/-** dozen.

Fig. 1361. RAWHIDE MALLETS.

No.	Diameter inches.	Length inches.	Weight ozs.	Price each.
1	1¼	2½	3	**1/10**
1a	1¼	4½	—	**3/8**
2	1½	2¾	5	**2/2**
3	1¾	3	7	**2/9**
4	2	3¼	10	**3/6**
5	2½	4	20	**6/5**
6	2¾	4½	24	**7/3**
6a	2¾	5	28	**8/2**

Fig. 1362. HIDE-FACED HAMMERS.
For working Fine Metals, etc.

No.	Weight lbs.	Diameter of Face. inches.	Overall Length of Head. inches.	Price each complete.	Price Faces only per pair.
1	1¼	1¼	4	**2/4**	**1/3**
2	2	1½	4½	**3/2**	**1/7**
3	2¾	1¾	5	**4/3**	**2/-**
4	4¼	2	5½	**6/3**	**2/9**
5	7¼	2¾	5¾	**9/9**	**4/3**

Fig. 1362. RAW HIDE FACED HAMMERS.

When raw-hide faces are worn out, can be replaced at small cost.

Fig. 1361. RAWHIDE MALLET.

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PICKS AND MATTOCKS.

Fig. 1370. Solid Eye Chisel and Point Pick Axes.

Price: 6 lbs. and up, **45**/– per cwt.; 5½ lb., **47/6** per cwt.; 5 lbs., **51/3** per cwt.

Fig. 1371. Solid Eye Double Point Pick Axes.

Price: 6 lbs. and up, **45**/– per cwt.; 5½ lbs., **47/6** per cwt.; 5 lbs., **51/3** per cwt.

Fig. 1372. Solid Eye Mattocks.

Price: 6 lbs. and up, **55**/– per cwt.

Fig. 1373. Solid Eye Fish Tail Picks.

Price: 6 lbs. and up, **55**/– per cwt.

Fig. 1374 Solid Eye Tee Beater Picks.

Price: 6 lbs. and up, **55**/– per cwt.

Fig. 1375. Solid Eye Roadside Mattocks.

Price: 6 lbs. and up, **75**/– per cwt.

Fig. 1376. Solid Eye Bright Grubbing Mattock.

Bright and japanned.

Size, lbs.	....	4	4½	5	5½	6
Price per doz.	....	**39**/–	**42**/–	**45**/–	**49**/–	**53**/–

Fig. 1377. Solid Eye Pick Mattocks.

Bright and japanned.

Size, lbs.	....	4	4½	5	5½	6
Price per doz.	....	**39**/–	**42**/–	**45**/–	**49**/–	**53**/

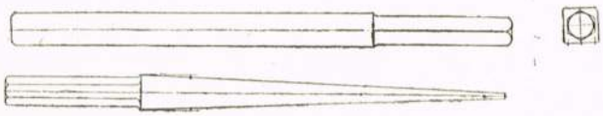

Fig. 1378. Plugs.

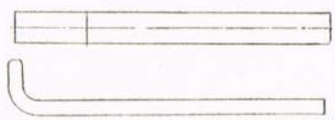

Fig. 1379. Feathers.

Plugs and Feathers or Concrete Bursting Tools, made of high-grade steel, for use in conjunction with pneumatic hammers. A hole is drilled in the concrete, the feathers are placed in position and the plugs driven by the pneumatic tool. Any size made to order.

Price—**1/6** per lb., Plugs and Feather.

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SHOVELS.

Fig. 1380.
Regular Pattern Navvy Strapped London Shovels.

3 rivets in straps. Rivetted D handle.

Number	1	2	3	4
Size	9½×12	10×12½	10½×13	11×13½
Price with rivetted D handle	**52**/–	**52**/–	**56**/–	**60**/–

Per dozen.

Fig. 1382. Strapped Railway Shovel.

3 rivets in straps. Rivetted D handle.

Number	2	3	4	5
Size	10½×12½	11×13	11½×13½	12×14
Price with rivetted D handle	**52**/–	**56**/–	**60**/–	**66**/–

Per dozen.

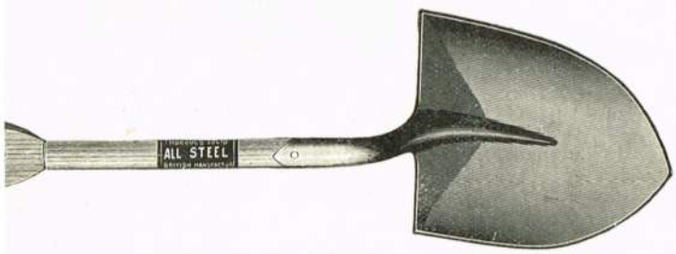

Fig. 1386. Stamped Steel Shovels.

Round mouth rolled blades. Rivetted D handle.

Number	2	3	4	5
Price per doz., with rivetted D handle	**30**/–	**32**/–	**34**/–	**36**/–
Number	6	7	8	
Price per doz., with rivetted D handle	**38**/–	**40**/–	**42**/–	

Crutch Handles, 1/6 per dozen less.

Side Straps, 4/– per dozen extra.

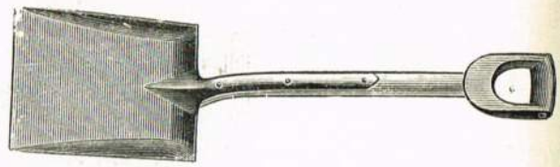

Fig. 1381. Thick Top Hand-hammered Strapped London Concrete Shovels.

Number	2	3
Size	10×12½	10½×3
Price with rivetted D handle	**66**/–	**72**/–

Fig. 1383. Strapped Mining Shovel.

Hammered from the bar. 3 rivets in straps. Rivetted D handle.

Number	2	3	4
Size	10×12½	10½×13	11×13½
Price per doz., with rivetted D handle	**58**/–	**58**/–	**61**/–

Number	5	6
Size	12×14	12½×14½
Price per doz., with rivetted D handle	**66**/–	**70**/–

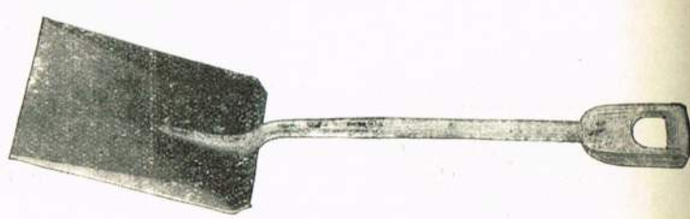

Fig. 1384. Stamped Steel Shovels.

Square mouth rolled blades. Rivetted D handle.

Price, with rivetted D handle, per doz.

Nos.	2	3	4	5	6	7	8
14 gauge	**32**/–	**34**/–	**36**/–	**38**/–	**40**/–	**42**/–	**44**/–
15 gauge	**30**/–	**32**/–	**34**/–	**36**/–	**38**/–	**40**/–	**42**/–

Fig. 1385. Special London Coal Shovel.

Hollow back, with rivetted D handle.

Similar to B24, but with shorter and extra stout handles, 13 gauge.

Number	4	6	8
Price per doz., with rivetted D handle	**38**/–	**42**/–	**46**/–

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SHOVELS.

Fig. 1387. Rivetted Back and Front Strap Shovels. Rivetted D or crutch handle.

Number	2	3	4	5	6
Size, inches	10×12½	10½×13	11×13½	12×14	12½×14½
Price with rivetted D handle, per dozen	**58**/–	**58**/–	**61**/–	**66**/–	**70**/–

If fitted with T or crutch handle, **1**/– dozen less.

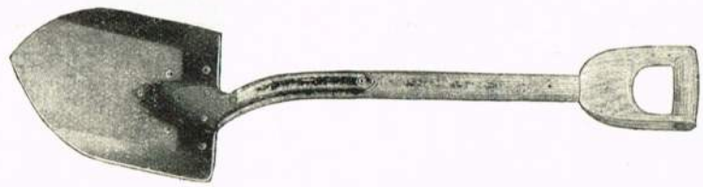

Fig. 1388. Rivetted Back and Front Strap Shovels. Rivetted D or crutch handle.

Number	2	3	4	5	6
Size, inches	9½×12½	10×12½	10½×13	12×14	12½×14½
Price with rivetted D Handle, per dozen	**58**/–	**58**/–	**61**/–	**66**/–	**70**/–

If fitted with T or crutch handle, **1**/– dozen less.

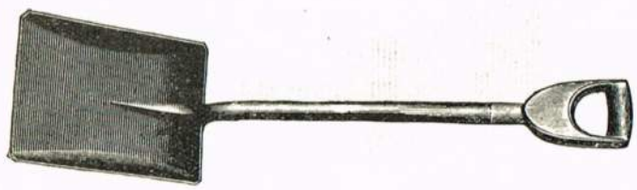

Fig. 1389.

Tar Shovels.

Fitted with wrought tubular socket to rivetted D handle.

Number	1	2	3
Size, inches	9½×12	10×12½	10½×33
Price, with rivetted D handle	**100**/–	**102**/–	**110**/–

Fig. 1390.

Solid Locomotive Firing Shovel.

Hammered from the bar, with clasped crutch handle, as shown.

Number	1	2
Size	8×16	9×18
Price per dozen	**84**/–	**88**/–

Fig. 1391.

Stamped Steel Rolled Blades Locomotive Firing Shovel.

With clasped crutch handle as shown.

Number	1	2
Size	8×16	9×18
Price per dozen	**54**/–	**58**/–

Crutch Handles, 1/6 per dozen less. **Iron Eye Handles, 4**/– per dozen extra

Side Straps, 4/– per dozen extra.

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SHOVELS AND GARDEN SHEARS.

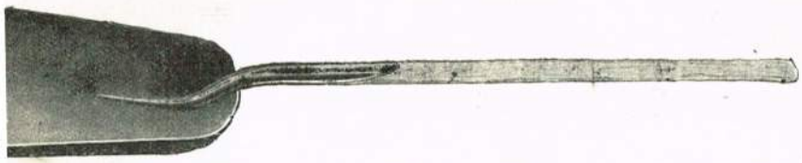

Fig. 1392. STAMPED STEEL MUD SCOOP.

Fitted with strong ash handle.
Size 10″ × 16″. Price per dozen .... **79/–.**

Fig. 1393. STAMPED STEEL HOUSEHOLD SHOVEL.

Number	2	3	4
Size, inches	5	5½	6
Price per dozen ...	**9/–**	**10/–**	**11/–**

Fig. 1394. STRONG STAMPED STEEL COAL SHOVEL.

Household pattern, with ash handle.
Size 12″ × 7″. Price per dozen .... **24/–.**

Fig. 1395. HAMMERED FIRE SHOVEL or PAN BITS.

Size, 6″ and up.
Price per lb. .... **9d.**

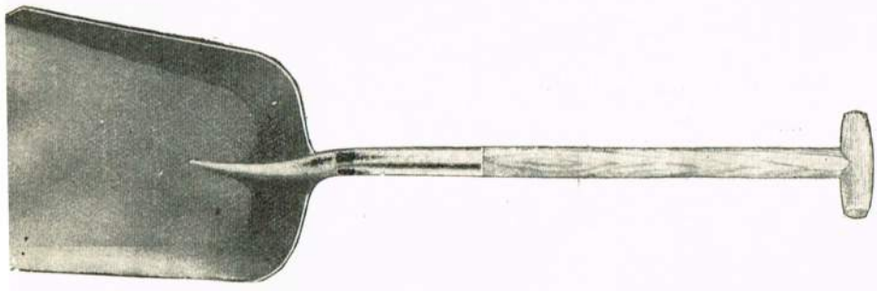

Fig. 1396.

Coal Firing Shovel.

Size 16 × 12. Per dozen, **79/–.**

With crutch handle.

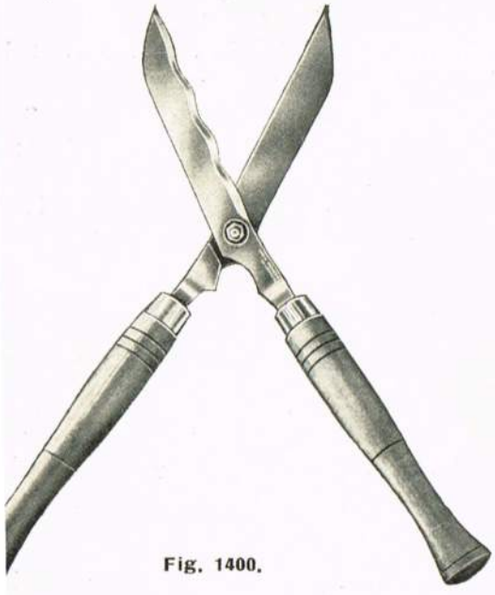

Fig. 1400.

Fig. 1400.

SMITH'S PATENT "WAIVIBLADE" GARDEN SHEARS

are specially suitable for heavy undergrowth, privet and holly hedges, jute and fibrous plant cutting. They are far ahead of the ordinary pattern, and save 50 per cent energy.

These Shears are manufactured from the finest tool steel, and tempered very carefully—in fact, they are the only garden shears made on precision lines. Everything used in their manufacture is of the finest. The ordinary garden shears cannot therefore be compared with Smith's "Waiviblade." The blades are ground by machinery after hardening, thus ensuring a clean, even cut. Owing to this system of grinding these shears will outlast six pairs of the ordinary pattern. They require grinding once in two years, and are therefore best and cheapest in the end. These shears can be ground by any tool grinder.

To enable the design of the "Waiviblade" shears to be made clearly shewn. The illustration gives the top blade as the wavy side, but actually it is the reverse.

SIZES AND PRICES.

Size, inches	8	9	10
Price	**8/3**	**9/3**	**10/6**
Size, inches	8	9	10
Border shears	—	**16/6**	—
Lawn shears	—	**16/6**	—
Ladies' shears	—	No. 1 **8/3**	No. 2 **8/9**

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PIPE LAYERING TOOLS.

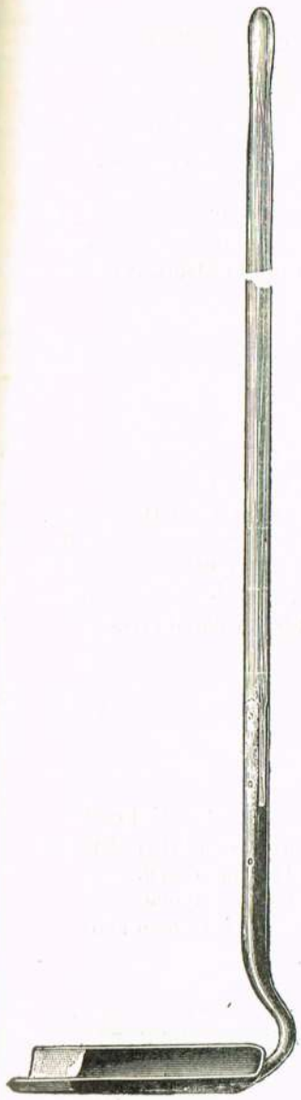

Fig. 1401. Crane Neck Scoop, with 5½ft. long handle. Hammered steel.

Width top of blade	3½″	4″
Width bottom ,,	2½″	3″
Length of Blade	18″	18″
Price, dozen	**46**/-	**47**/-

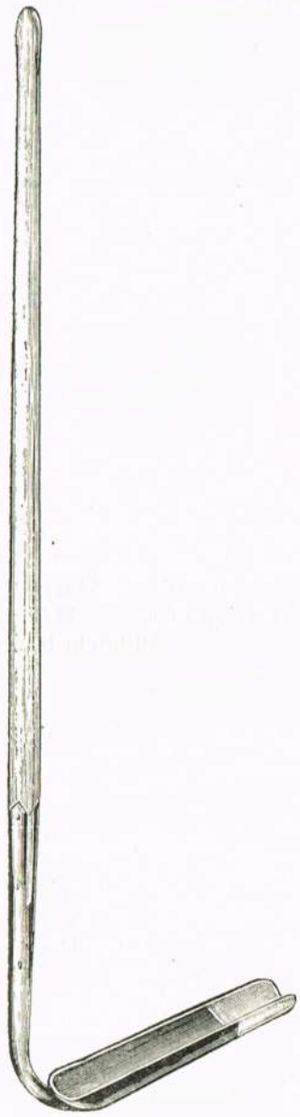

Fig. 1402. Crane Neck Scoop, with 5½ft. long handle. Hammered steel.

Width top of blade	3½″	4″
Width bottom ,,	2½″	3″
Length of blade	18″	18″
Price, dozen	**45**/-	**46**/-

Fig. 1403. Crane Neck Scoop, with 5½ft. handle. Hammered steel.

Width top of blade	3½″	4″
Width bottom ,,	2½″	3″
Length of blade	18″	18″
Price, dozen	**46**/-	**47**/-

Fig. 1404. Pipe Layer, with 5½ft. handle.
Price, **38**/- dozen.

Fig. 1405. DRAINING TOOLS.
Solid Neck tubular to Handle.

Length, inches ...	14	15	16	18	20
Width top, inches ...	5½	5½	6	6	6
Width, bottom, inches ...	3	3	3	3	3
Price, dozen, D handle, hammered steel ...	**48**/-	**49**/-	**50**/-	**51**/-	**52**/-

Strapped with 3 Rivets—
Price, dozen, D handle, hammered steel, 14″, **50**/- ; 16″, **52**/- ; 18″, **54**/- ; 20″, **56**/-

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SHOVELS AND FORKS.

Fig. 1406. Strapped Thick Top Spades

with rivetted D Handle and 3 rivets in straps.

Number	1	2	3
Size, inches	7½ × 11½	8 × 2	8½ × 12½
Price, per doz.	**64/-**	**66/-**	**68/-**

Half bright blades, **3/6** doz. ; all bright blades, **10/-** doz. extra.

Fig. 1407. Open Socket Stamped Steel Rolled Blade

with rivetted D Handle.

Number	1	2	3
Size, inches	7½ × 11½	8 × 12	8½ × 12½
Price, per doz.	**42/-**	**44/-**	**46/-**

Half bright blades **3/6** doz. ; all bright blades **10/-** doz. extra.

Fig. 1408. Strapped Border Spades.

2 rivets in straps. Rivetted D Handle. ¼ bright blades.

Number	1	2	3
Size, inches	5½ × 9	6 × 9	6½ × 10
Price, per doz.	**58/-**	**60/-**	**62/-**

Bright and blued, **11/-** per dozen extra.

Fig. 1409. Solid Socket Spades

with half bright blades and rivetted D Handle.

Number	1	2	3
Size, inches	7½ × 11½	8 × 12	8½ × 12½
Price, per doz.	**95/-**	**98/-**	**102/-**

All bright blades, **10/-** per dozen extra.

Fig. 1420. Strapped Border Forks.

2 rivets in straps. Black square prongs.
Rivetted D Handle.

4 Prongs. Price **66/-** per dozen.

Bright and blued prongs, **6/-** per dozen extra.

Fig. 1421. Strapped Potato Forks.

3 Rivets in straps. Flat or diamond shaped prongs.

4 Prongs. Price **76/-** per dozen.

5 Prongs. Price **90/-** per dozen.

Bright and blued prongs, **6/-** per dozen extra.

Fig. 1422. Heavy Agricultural Forks.

Strapped up to Crutch Handle. 3 Square black prongs.

Price **100/-** per dozen.

Fig. 1423. Strapped Manure Forks.

Oval prongs. Bright and blued finish. Rivetted D Handle.

4 Prongs. Price **74/-** doz. 5 Prongs. Price **88/-** doz.

If with long handle, **6/-** per dozen extra.

If with strong iron eye handle, **10/-** per dozen extra.

Fig. 1410. Stamped Steel Grain Scoop

with rivetted D Handle.

mber	1	2	3	4
e, inches	11 × 14½	12 × 16	12½ × 16½	13 × 17
ce, per doz.	**72/-**	**76/-**	**80/-**	**82/-**

Fig. 1412. Scaffold Cords.

Strong flexible Galvanized Steel Wire. Best quality.
With Ferrule and Galvanized Eye.
Price **24/6** dozen.

Crutch handles on all above, **1/-** per doz. less. Iron eye handles, **4/-** doz. extra. Side straps, **4/-** doz. extra.

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FORKS.

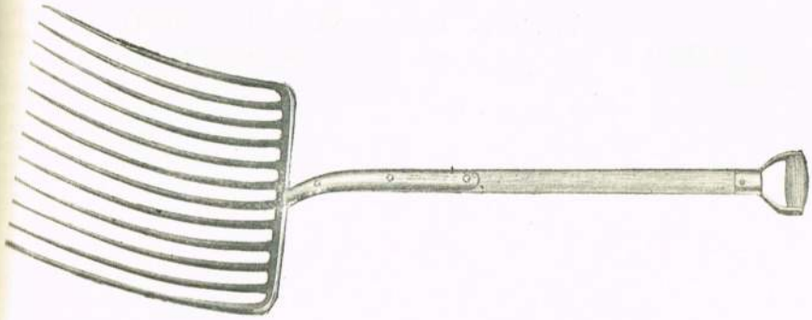

Fig. 1424.

Strapped Coke Forks.

Turned up sides. 3 rivets in straps and with iron eye, (as shown).
Crutch or rivetted D handle.

10 to 16 prongs. Price **1/6** per prong.

Fig. 1425. Strapped Tarmac Forks.

Square prongs, fitted with rivetted D or crutch handles.

Price .... **1/4** per prong.

Fig. 1426. Tar Forks.

Four-prong. Fitted with wrought tubular socket to rivetted D handle.

Price per dozen .... **100/–.**

Fig. 1427. Trenching Forks.

Strapped up to rivetted D handle.
4 square prongs.

Price per dozen .... **100/–.**

Fig. 1428. Strapped Digging Forks.

3 rivets in straps. Square black prongs.
Rivetted D handle.

		Prongs 4	Prongs 5
Price per doz.,	Black	**66/–**	**80/–**
,, ,,	Bright and blued	**72/–**	**86/–**

Crutch Handles, 1/6 per dozen less. **Iron Eye Handles, 4/–** per dozen extra.

Side Straps, 4/– per dozen extra.

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GRAFTING TOOLS, Etc.

If fitted with extra long straps.
15″ long, **10**/– per dozen extra.
18″ long, **16**/– per dozen extra.

Fig. 1429. Strapped Forged Steel Grafting Tool.

Rivetted D handle. 3 rivets in straps.

Number	1	2	3
Size, inches....	6×12½	6½×13	7×13½
Price per doz., with rivetted D handle	**52**/–	**52**/–	**56**/–

Fig. 1430. Tar Spades.

Fitted with wrought tubular socket to rivetted D handle.

Number	1	2	3
Size, inches	7½×11½	8×12	8½×12½
Price per dozen	**94**/–	**96**/–	**100**/–

Fig. 1431. Best Quality London Treaded Spades.

3 rivets in straps, fitted with rivetted D handle.

Number	0	1	2	3
Size inches	7×11	7½×11½	8×12	8½×12½
Price per dozen	**57**/–	**58**/–	**60**/–	**62**/–

Fig. 1432. Road Contractors' Rakes.

12 to 18 tooth. Welded shaft, rivetted through steel ferrule, with ash handle, 72 ins. long.
Can be made with socket shaft, round or square teeth, spot-welded.

Fig. 1433.. Road Contractors' Rakes.

12 to 18 tooth. Rivetted socket shaft, with ash handle, 72 ins. long.

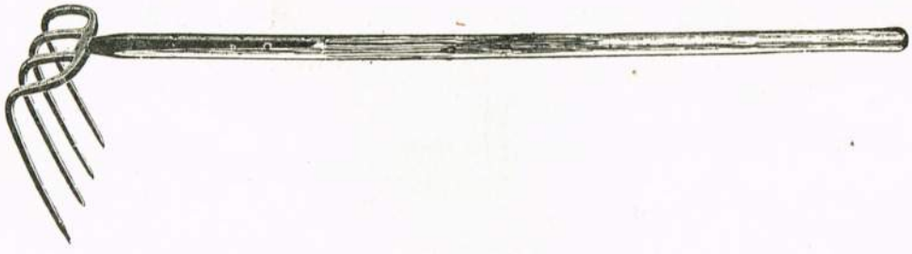

Fig. 1434. Scrap Drap with rivetted strapped ash handle.
4, 5, or 6 tooth.

Crutch Handles, 1/6 doz. less.

Iron Eye Handles, 4/– per doz. extra. **Side Straps, 4**/– per doz. extra.

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TRUCKS AND BARROWS.

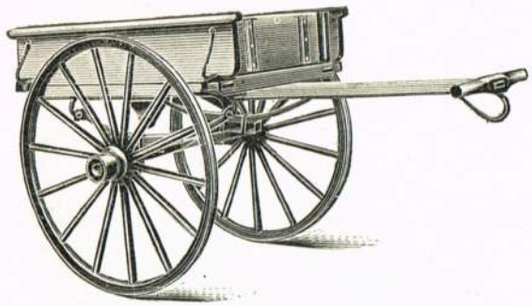

Fig. 1440. BUILDERS' HANDCART.

Hardwood throughout. Gravel iron and bumpers. 11″ plank sides bolted to frame. End boards to slip in. Steel springs and axle clips. 36″ wheels. Painted any plain colour.

Size ft.	in.		ft.	in.	To carry cwts.	Price £	s.	d.
2	6	×	3	6	4	**9**	**10**	**0**
2	8	×	3	9	6	**10**	**12**	**6**
2	8	×	4	0	10	**11**	**19**	**0**

With swinging end boards on chains, **17**/– extra.

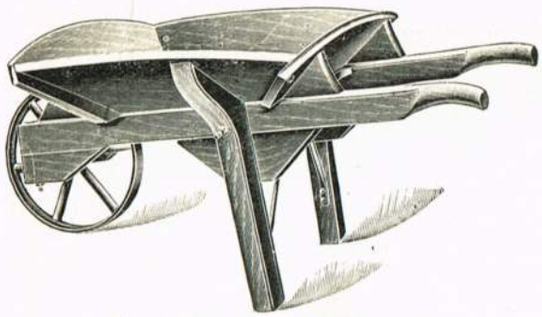

Fig. 1441. NAVVY BARROWS.

Constructed of 1″ elm body, ash or oak frame.

Length at top 30″; width on top 28½″; depth at front 12½″; depth at back 7½″.

No.	Wheels.	Price each
A ...	16″ x 1¼″ C.I.	**18**/-
B ...	16″ x 1½″ C.I.	,, ,, **21**/-
C ...	17″ x 1¾″ W.I.	,, ,, **23**/6
D ...	18″ x 2″ W.I.	,, ,, **22**/6

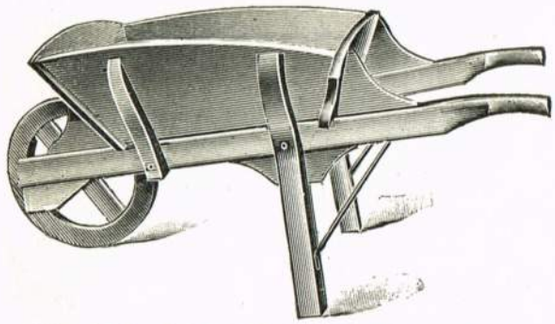

Fig. 1443. GENERAL PURPOSE BARROW.

Made of ash and elm, with wood side cleats and iron leg stays. With 16½″×1½″ iron treaded wheel. Length of frame 48″; body 29″×23″. Depth of front 12½″; back 8¾″.

Price ... **30**/– each.

With 2″ cast-iron wheel, **28**/–. With wrought iron bearings **1**/**9** each extra. Painting, **5**/**6** each extra.

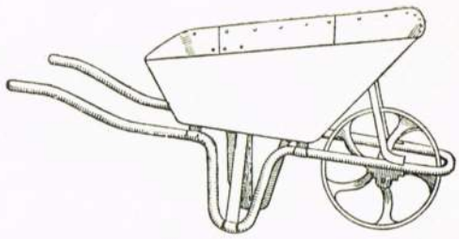

Fig. 1445. SPECIAL STEEL CONCRETE AND GENERAL PURPOSE BARROW.

Flush rivetted inside. Sides kept straight as possible to prevent mixture spilling. Raised tubular handles. Weight 60 lbs.

No. 1 size.—Approx. 3 cubic feet ... ... Price **33**/- each.
No. 2 size.—Approx. 4 cubic feet ... ... Price **36**/- each.

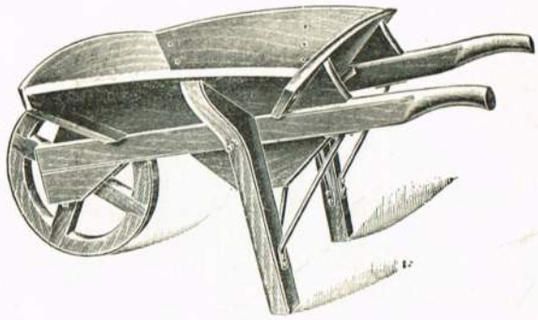

Fig. 1442. NAVVY BARROWS.

With wood wheels, elm body, ash frame, legs and wheel runners. ½″ cross frame bolt. 2 steel strengthening stays. Hardwood wheel, 16″ diameter, with 1½″ tread. Carry 2 bushels. Weight 72 lbs. Length of frame 48″; body 28″×26″. Depth of front 11½″; back 8″.

Price ... **24**/– each.

With wrought iron bearings, **1**/**6** per pair extra.
Wood side cleats, **1**/– per barrow extra.

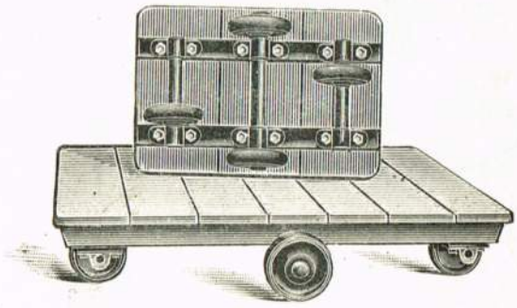

Fig. 1444. PLATFORM TROLLIES.

Made to run on centre wheels. Of selected hardwood, with heavy bolted-on ironwork. Painted, varnished wood, good finish.

Size ...	1	2	3	4	5
Platform size, inches	18×12	24×16	30×20	36×24	42×24
Price each... ...	**35**/–	**40**/–	**45**/–	**50**/–	**65**/–

Size ...	6	7	8	9
Platform size, inches	48×26	50×30	54×30	60×36
Price each... ...	**75**/–	**90**/–	**105**/–	**120**/–

If fitted with pivotted iron handle, **27**/**6** each extra.

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STEEL BARROWS.

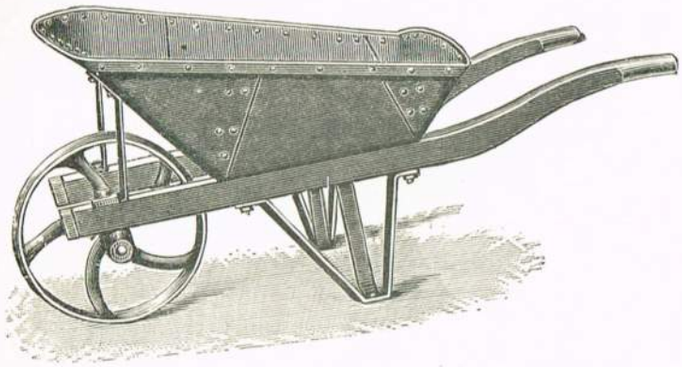

Fig. 1446. New Design Foundry or Navvy Barrow. Steel body, wheels and legs, and wooden frame. A most suitable barrow for hard wear.

Size.		Capacity.	Price each.
1	Large ...	5 cubic feet ...	**46/–**
2	Medium ...	4 ,, ,, ...	**41/–**
3	Small ...	3 ,, ,, ...	**37/–**

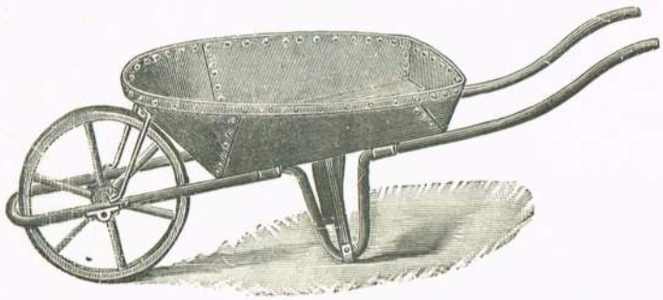

Fig. 1447. Extra Strong Ironworks, Foundry, Navvy and Mining Barrow. Large sizes, No. 1 and 2, fitted with 18 inch and small size, No. 3, 16 inch crucible steel wheels. Steel body of 14 wire gauge, except size 2 which is constructed of 10 wire gauge.

Size	1	2	3
Gauge	14	10	14
Top	34×29	34×29	31×28
Depth in inches, Front... ...	14	14	12
Back	7	7	6
Dimensions in inches at Bottom, Length	18	18	18
Width	18½×14	18½×14	18½×14
Height, inches	21	21	18
Weight, lbs.	91	—	70
Price, each	**35/–**	**37/–**	**33/–**

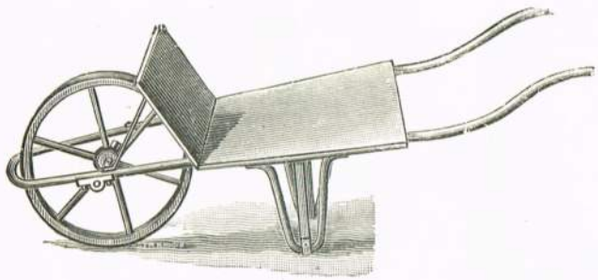

Fig. 1448. Pig Metal or Strapper's Barrow. Made with $\frac{3}{16}$in. sheet metal. Strong tubular frame. 18in. crucible steel wheel.

Size	1	2
Dimensions in inches, Length	20	17
Widest	21	21
Front depth	12	18
Weight, lbs.	91	91
Price, each	**35/–**	**35/–**

Fig. 1449.

Fig. 1450.

Fig. 1451.

Best Crucible Steel Wheels, with or without Axles.

Diam. of Wheel, inches	9½	14	16	18	20	22	24	36
Width of Tread, inches	2	1½	1¾	1½	2	1½	1½	2
Diam. of Boss, inches	2¼	2⅛	2	2⅛	2⅜	2⅛	2½	3
Length of Cores, inches	2¾	3	2 5/16	2¾	3 1/16	2½	5	4½
No. of Spokes ...	5	5	5	5	5	5	5	6

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STEEL BARROWS.

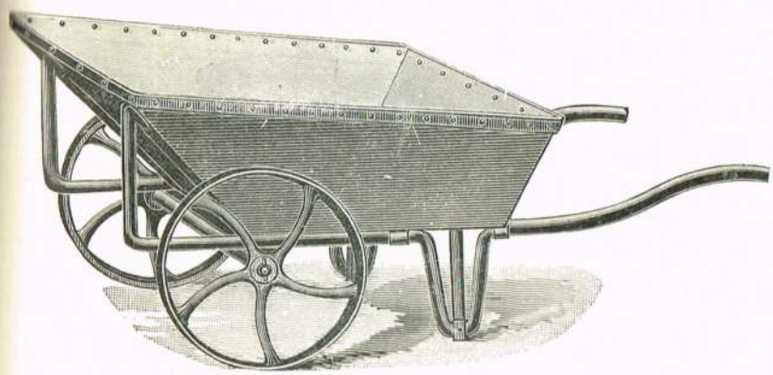

Fig. 1452. Double Wheel Hot Coke Barrow. With solid sides and tubular frame, well balanced and not easily upset. Used by contractors, gas works, concrete and cement makers. Fitted with 18 inch crucible steel wheels. Steel body made of 10 and 12 gauge steel.

Size	0	1	2
Depth in inches, Front	25	22	20
Back	14	12	10
Dimensions in inches, Top ...	49×40	42×34	40×32
Bottom, wide ...	26×29	25×27	25×27
Height, inches...	30	26	24
Weight, lbs.	180	168	150
Price, each	**95/–**	**65/–**	**60/–**

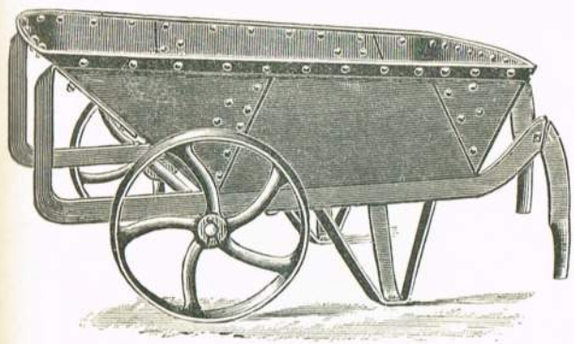

Fig. 1453. Double Wheel Steel Barrow for Coal, Coke, etc. Largely used by builders and contractors for hoisting bricks, mortar, etc., to high buildings. Fitted with self-locking drop handles. Angle iron frame.

Size	1	2
Dimensions in inches, Length	44	40
Width	40	36
Capacity, cubic feet	7	6
Price, each	**70/–**	**65/–**

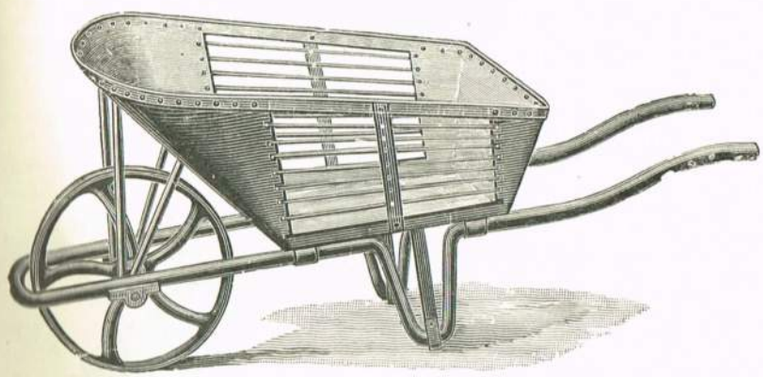

Fig. 1454. Single Wheel Hot or Cold Coke, Shale, Ash, Lime and Navvy Barrows, of new design, with ribbed sides. Fitted with tubular framework and 18in. crucible steel wheels. Steel body constructed of 10 Wire Gauge.

Size	1	2
Depth in inches, Front	27	24
Back	13	12
Dimensions in inches at bottom,		
Length	20½	20½
Width	21×18½	21×18½
Top, in inches	48×38	41×36
Height, inches	30	28
Weight, lbs.	150	140
Price, each	**67/6**	**60/–**

Special Prices for large quantities for Export.

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TAR CANS, Etc.

Fig. 1460. Galvanized Tar Cans.
Strong fluted bail, round back handle.
2 Gallons, weight 5 lbs. each, **102**/– dozen.
3 Gallons, weight 6 lbs. each, **126**/– dozen.

Fig. 1461. Galvanized Tar Buckets.
Forged ears, round, flulted or oval bails, double hoop foot, and round back handle.
12″, weight 84 lbs. dozen; Price **84**/– dozen.

Fig. 1462. Strong Galvanized Ship's Bucket.
Forged hoop top and bottom, forged bars inside ring and thimble bail.
11″ across top, 9″ deep inside, 8″ bottom.
Weight 60 lbs. per dozen.
Price **60**/– per dozen.

Fig. 1463. Strong Galvanized Boiler Fillers.

Size	2	3	4 gallons.
Price	**90**/–	**108**/–	**132**/– dozen.

Fig. 1464. Strong Galvanized Jets.

Size across top	8	9	10	11 inches.
Price	**122/6**	**137**/–	**152**/–	**167**/– dozen.

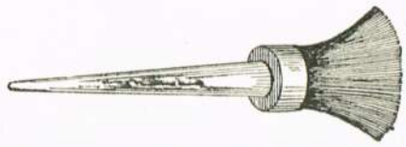

Fig. 1465. Short Handle Tar Brushes.
Good Mixture.

No.	1	2	3
Price	**16**/–	**20**/–	**24**/– per dozen.

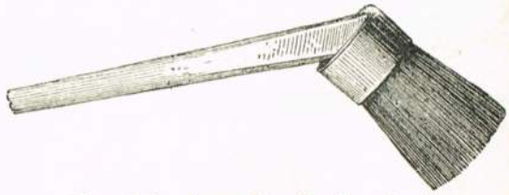

Fig. 1466. Long Handle Tar Brushes.

No.	1	2	3
Price	**23**/–	**27**/–	**31**/– per dozen.

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SACK BARROWS, WATER CANS, Etc.

Fig. 1470. SACK TRUCKS.

		Price each
No. 8.	3 ft. 3 in. high, 4 in. wrought iron head, ash frame, 6 in. cast iron wheels	**30/–**
No. 9.	3 ft. 6 in. high, 5in. to 6 in. ,, ,, ,, 7 in. ,, ,, ...	**34/6**
No. 10.	3 ft. 9 in. high, 6 in. ,, ,, ,, 8 in. ,, ,, ...	**39/6**
No. 11.	4 ft. 0 in. high, 7 in. to 8 in. ,, ,, ,, 9 in. ,, ,, with wood or iron legs	**44/6**
No. 11a.	4 ft. 6 in. high, 9 in. wrought iron head, ash frame, 10 in. cast iron wheels, with wood or iron legs	**50/–**

The above can be had fitted with rubber tyred iron wheels or carbonite rubber wheels.

Fig. 1471.

BUILDERS' STEPS.

Selected timber, with strong pressed steel butts, check cords, and iron tie-rods.

Strong quality	Tread	Super quality
9/3	6	**12/–**
10/6	7	**13/6**
12/–	8	**15/6**
13/6	9	**17/6**
15/–	10	**18/6**
—	11	**22/–**
—	12	**24/6**
—	13	**27/–**
—	14	**29/6**

Fig. 1472. BUILDERS' RUBBISH BASKETS.

Made from stout selected cane.
Capacity, 1 bushel.
Price ... **5/6** each ; **60/–** dozen.

Fig. 1473.

As above, but re-inforced iron rod through handles and bottom.

Price
6/6 each ; **69/6** dozen.

Fig. 1474.

Fig. 1475.

ROAD CONTRACTORS' SPIKES.

Manufactured from high-grade steel, hardened heads and points.
Any design made to order in a few days.
Prices from **3d.** to **5d.** per lb., according to design.

Fig. 1476. BUILDERS' MAULS.

Made to suit customers' requirements in 24 hours, with or without iron hoops. Well-seasoned wood only used in their manufacture.
Prices upon application.

Fig. 1477.

STRONG GALVANISED BUCKETS FOR BUILDERS' USE.

Rivetted sides. Forged ears. Strong handles.

	Size 12	13 inches	
Weight for 12″			
60 lbs.	**42/–**	**45/–**	per doz.
72 lbs.	**44/–**	**47/–**	,,
84 lbs.	**51/–**	**55/–**	,,

Extra strong. Rivetted sides. Forged ears. Welded hoop top and bottom. Bar front and back.

	Size ... 12	13	14 inch	
Weight, 120 lbs. for 12″...	**87/–**	**93/–**	**98/–**	per doz.

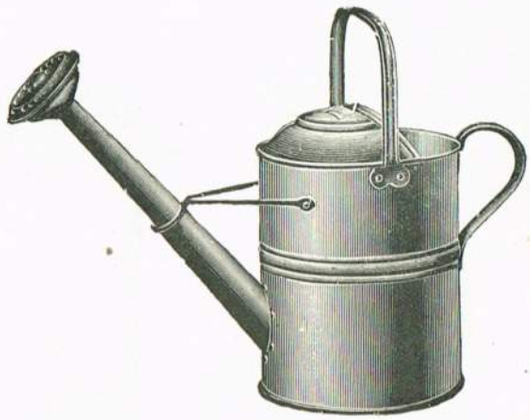

Fig. 1478.

HEAVY GALVANISED WATERING CANS.

With copper or brass screw-on roses.

Gallons ...	1½	2	2½	3
Price per doz.	**60/–**	**72/–**	**81/–**	**93/–**

Fig. 1478A.

If with galvanised slip-on roses.

Gallons ...	2	2½	3	4
Price per dozen	**125/–**	**135/–**	**150/–**	**180/–**

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HUTS, TOOL BOXES, Etc.

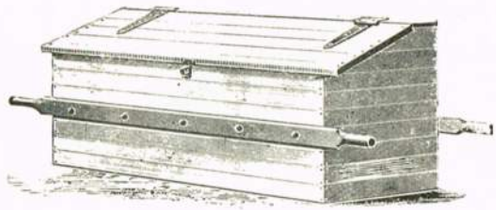

Fig. 1483.

CONTRACTORS' TOOL CHESTS.

Useful for holding shovels, picks, etc.

Fitted with shafts for carrying.

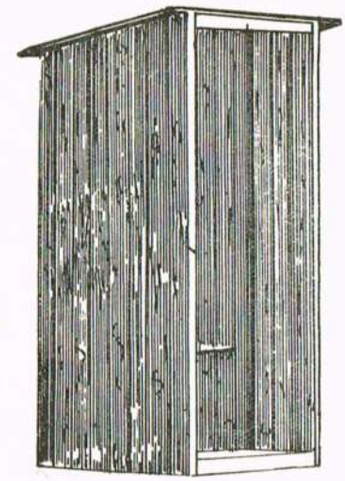

Fig. 1480.

PORTABLE WATCHMAN'S HUT.

Constructed of weatherboard or tongued and grooved board.

Made to customer's specifications.

Fig. 1481.

TOOL CHEST

For contractors' tools.

Fitted with heavy chains and hinges.

With hasp and staple.

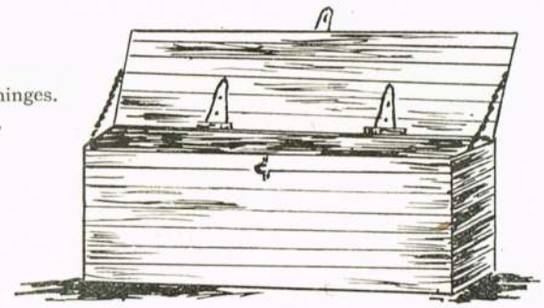

Fig. 1482.

FOLLING ROAD TRESTLES.

Light and strong.

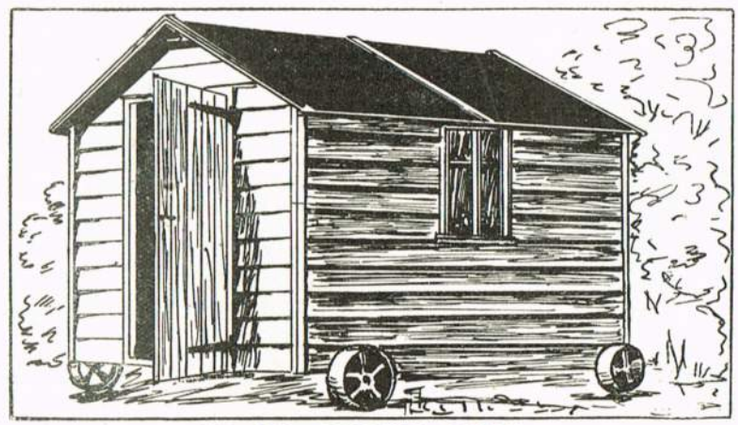

Fig. 1479. PORTABLE HUTS.

For storage of tools, etc., or timekeeper's hut.

Constructed of weather boards on heavy framing.

Fitted complete with drawing table and drawer, and 4 wheels.

Price ... **£19 0 0.**

Fig. 1484.

PAVIOR'S RAMMER.

Supplied to any dimensions.

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METAL POTS, SKIPS, Etc.

Fig. 1485. WROUGHT IRON LEAD LADLES.

Size, inches	2½	3	3½	4	5	6	7	8	10
Capacity, lbs.	⅞	2	3	4	7	14	24	35	46
Price each ...	**1/5**	**1/6**	**1/7**	**1/9**	**2/3**	**2/5**	**2/6**	**2/10**	**4/–**

Fig. 1485A. Heavy Bowls only, with bit for welding.

Size, inches	4, 4½ 5	6	7	8	10	11
Price per lb.	**9d.**	**8½d.**	**8d.**	**8d.**	**7½d.**	**7½d.**

Fig. 1486.

WROUGHT IRON PITCH AND SEAMING LADLES.

Size, diameter, inches	4	4½	5	5½	6
Price each	**1/10**	**2/1**	**2/6**	**2/10**	**3/4**

Fig. 1487.
PLUMBERS' POTS.

Inside Diam. ins.	Capacity lbs.	Price per lb.
4	14	**8d.**
4½	17	**8d.**
5	20	**6d.**
5½	28	**6d.**
6	34	**6d.**
7	56	**6d.**
8	84	**6d.**
9	112	**6d.**
10	150	**6d.**
11	200	**6d.**
12	250	**6d.**
14	400	**5d.**

Fig. 1488.

STEEL TIPPING SKIPS.

Made of steel plate. Self-tipping when full, falling into correct position when emptied. Bale clip fitted.

We can make crane skips any dimensions, both circular and rectangular. Prices on receipt of specification.

Capacity	Top	Bottom	Depth	Sides	Bottom	Bewel	Approx. Weight	Price each
¼ cu. yd.	27 in.	23 in.	25 in.	⅛ in.	3/16 in.	1⅜ in.	1¾ cwt.	**£7 10 0**
½ ,,	34 ,,	29 ,,	31 ,,	⅛ ,,	3/16 ,,	1½ ,,	2½ ,,	**£11 0 0**
¾ ,,	39 ,,	34 ,,	34 ,,	3/16 ,,	5/16 ,,	1⅝ ,,	4¼ ,,	**£15 15 0**
1 ,,	43 ,,	37 ,,	38 ,,	3/16 ,,	5/16 ,,	1¾ ,,	5¼ ,,	**£19 15 0**
1½ ,,	49 ,,	42 ,,	44 ,,	3/16 ,,	5/16 ,,	2 ,,	6½ ,,	**£24 5 0**
2 ,,	54 ,,	46 ,,	46 ,,	3/16 ,,	⅜ ,,	2¼ ,,	9 ,,	**£28 10 0**

Fig. 1490. STONE OR TIMBER DOGS.

To lift tons	1½	2	3
To take in, inches	15	21	27
Approx. weight, lbs. ...	53	84	161
Price each	**100/–**	**110/–**	**140/–**

Fig. 1489.

EARTH RAMMERS.

Size, lbs. ...	7	8	10	12
Price each ...	**1/10**	**2/–**	**2/3**	**2/6**
Size, lbs. ...	14	16	18	20
Price each ...	**3/–**	**3/3**	**3/6**	**3/9**

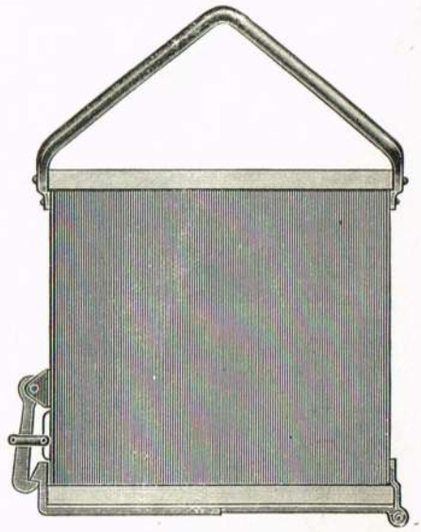

Fig. 1491. DROP-BOTTOM CRANE SKIPS.

Prices on receipt of complete specification.

Fig. 1492.

ROAD WEDGES OR CONCRETE BREAKING POINTS.

Diamond or chisel pointed.
Made in hexagon or square.

2×1½ 15×1½ 18×1¾ 24×1¾ 30×2 inches

Price ... **27/–** per cwt.

Tongs for above, **1/-** per lb.

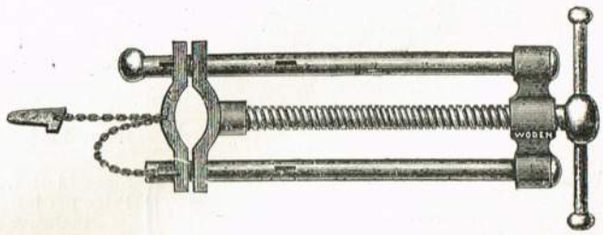

Fig. 1493. RIGGING SCREW.

Mild steel screw, rods and handle. Malleable iron fittings.

Size, inches ...	10	12	14	16	18	20	24
Price each ...	**16/3**	**16/9**	**17/9**	**18/–**	**19/–**	**19/3**	**20/3**

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FIRE DEVILS, Etc.

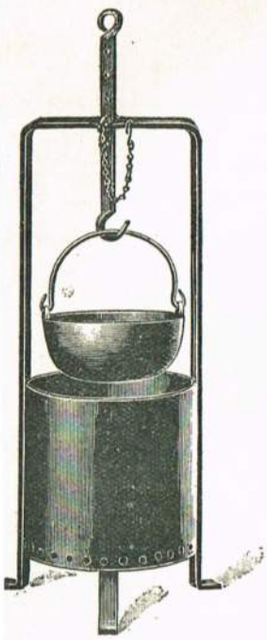


Fig. 1494. Fire Devil with pin and chain adjusting bar and hook.

iam. ns.	Thickness of body ins.	Price each
12	3/16	**44/–**
14	3/16	**56/–**
16	3/16	**71/–**
18	¼	**90/–**
20	¼	**115/–**

Fig. 1495. Fire Devil with double bridge. Screw and wing bar.

Diam. ins.	Thickness of body ins.	Price each
12	3/16	**57/–**
14	3/16	**67/6**
16	3/16	**81/–**
18	¼	**96/–**
20	¼	**112/6**
24	¼	**124/–**

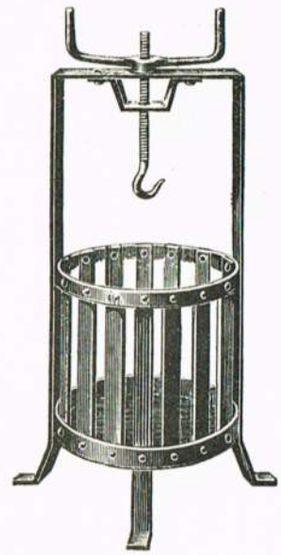
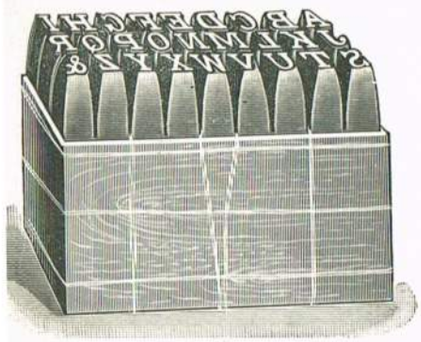


Fig. 1496. Fire Devil with double bridge, screw and wing bar.

Diam. ins.		Price each
15	...	**70/–**
16	...	**82/–**
18	...	**97/–**
20	...	**114/–**

Fig. 1497. Fire Basket with removable heavy cast iron grating and strengthening ring on legs.

Diam. ins.	Height ins.	Price each on 3 legs	Price each on 4 legs
12	24	**33/–**	**38/–**
14	24	**39/–**	**44/–**
16	26	**45/–**	**50/–**
18	27	**55/–**	**60/–**
20	27	**60/–**	**65/–**
24	27	**72/–**	**77/–**



In Sets.

Fig. 1498.
CAST STEEL LETTER AND FIGURE PUNCHES.

Complete in sets.

Size of letter or figure, ins.	1/32	3/64	1/16	3/32	⅛
Engineers' letters, for steel	**20/–**	**20/–**	**18/–**	**18/–**	**19/6**
Do. Figures ...	**6/8**	**6/8**	**6/–**	**6/–**	**6/6**
Ordinary metal or wood letters	**20/–**	**20/–**	**16/6**	**16/6**	**16/6**
Do. Figures ...	**6/8**	**6/8**	**5/6**	**5/6**	**5/6**

Size of letter or figure, ins.	3/16	¼	5/16	⅜	½
Engineers' letters for steel	**24/–**	**33/–**	**40/–**	**60/–**	**75/–**
Do. Figures ...	**8/–**	**11/–**	**13/4**	**20/–**	**25/–**
Ordinary metal or wood letters	**20/–**	**24/–**	**33/–**	**40/–**	**60/–**
Do. Figures ...	**6/8**	**8/–**	**11/–**	**13/4**	**20/–**

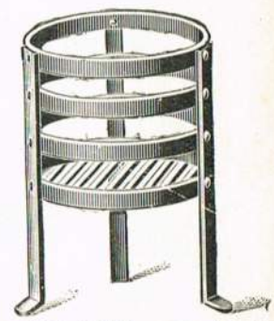


Fig. 1497A. Fire Devil.

Diam. ins.	12	14	16
Price each	**16/6**	**24/-**	**29/3**

Fig. 1499. CAST STEEL HAND STAMPS.

Price per letter inclusive.

Size of letter, inches ...	⅛	5/32	3/16	¼	5/16	⅜	½
For steel	**1/–**	**1/2**	**1/6**	**2/–**	**2/6**	**3/–**	**4/–**
For metal	**–/10**	**1/–**	**1/4**	**1/10**	**2/2**	**2/4**	**3/4**
For wood	**–/8**	**–/10**	**1/2**	**1/6**	**1/10**	**2/4**	**3/–**

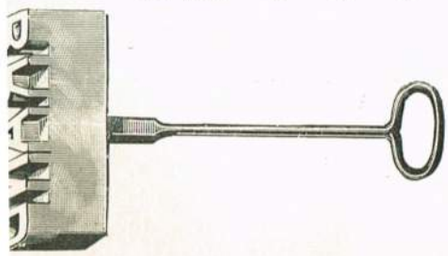


Fig. 1500. BEST WROUGHT BRANDING IRONS.

Size of letter, inches	¼	5/16	⅜	½	⅝	¾
Price per letter, inclusive ...	**2/6**	**2/6**	**2/4**	**2/4**	**3/6**	**4/6**

Size of letters, inches	⅞	1	1⅛	1¼	1½	2
Price per letter, inclusive ...	**5/6**	**6/–**	**7/6**	**9/–**	**11/–**	**16/–**

Branding Irons.

Figure Brands, in sets of 9, as 9 letters.

Re-cutting, ⅓ less per letter.

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SIEVES.

Fig. 1501. Steel Wire Foundry or Gravel Sieves, Beech Rims, **four** crossbars.
Nos. 3 to 16 mesh, 18″, **53**/– doz.; 20″, **61**/– doz.; 22″, **69**/– doz.

Fig. 1502. Woven Wire Grading Sieves, Beech Rims, **three** crossbars.

Diameter, inches	18	20	22	
Steel, No. 4 to 14 mesh	**41**/–	**46**/–	**53**/–	per dozen
No. 16 to 18 mesh	**46**/–	**53/6**	**62**/–	,,
No. 20 to 24 mesh	**52**/–	**59**/–	**68**/–	,,
Copper, No. 4 to 14 mesh	**63**/–	**73**/–	**86**/–	,,

Fig. 1503. Steel Wire Plasterers' or Sand Sieve, Beech Rims, three crossbars.

Nos. 4 to 12 mesh ... 18″ diam., **34**/– per doz.; 20″ diam., **38/6** per doz.
Nos. 14 to 16 mesh ... 18″ diam., **37**/– per doz.; 20″ diam., **42/6** per doz.

Fig. 1504. Extra Strong Steel Wire Locket Gravel Screens, with stout wood frames, well stamped with galvanized sheet iron.

Mesh, inches...	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	
Size 60″×30″	**40**/–	**37**/–	**34**/–	**33/6**	**32/6**	**32**/–	each
66″×33″	**47**/–	**40**/–	**36**/–	**35**/–	**34**/–	**33**/–	,,
72″×36″	**58**/–	**47**/–	**45**/–	**44**/–	**42**/–	**40**/–	,,

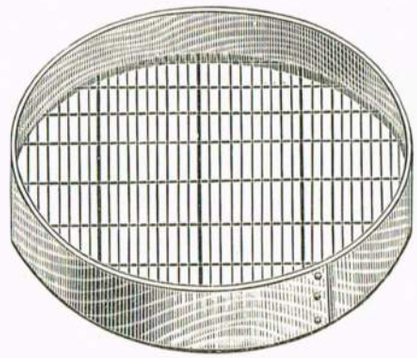

Fig. 1505. Extra Strong Gravel Sieves, straight mesh, Beech Rims.

Meash, inches	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	
20″ diam.	**60**/–	**49**/–	**45**/–	**44**/–	**41**/–	**35/6**	dozen
22″ diam.	**70**/–	**60**/–	**57**/–	**54**/–	**51**/–	**42**/–	,,

Fig. 1506. Tin Framed Paint Strainers, detachable Copper Gauze. Bottoms, $2\frac{1}{2}$″ deep.

Diam., Top, inches	6	7	8	9	10	
Diam., Bottom, inches	3	4	5	6	7	
Price ...	**13/3**	**15**/–	**16/9**	**18/6**	**20**/–	dozen

Bottoms only, price per dozen, 3″, **2/6**; 4″, **3/6**; 5″, **4/6**; 6″, **5/9**; 7″, **7**/–

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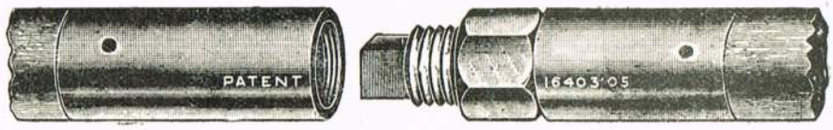
DRAIN TOOLS.



This illustration represents the **PERFECT PATENT LOCK JOINT**. The square head engages with a slot in the ferrule, ensuring a perfectly reliable joint, without any projecting point. Can be fitted to Council and Contractor's machine.

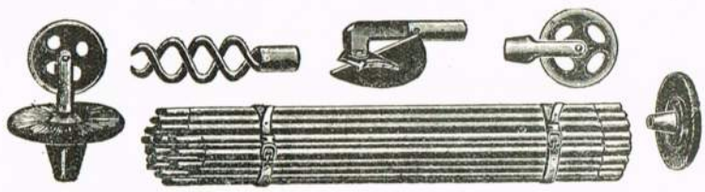


Fig. 1507. THE "COUNCIL" DRAIN CLEANSING MACHINES.

The canes are of special sound and tough malacca. Best whalebone, iron forgings and best brass castings only being used. Comprising 36″ rods, including 4″ or 6″ whalebone head, double worm screw, 4″ drop scraper, 4″ rubber plunger, brass clearing wheel, and a pair of strong straps.

Length, feet	30	40	50	60	70	80	90	100	150	250
Fig. 1507. Set complete as above, with interchangeable brass screws	**43**/–	**50**/–	**60**/**6**	**68**/–	**75**/**6**	**85**/**6**	**93**/–	**101**/–	**144**/–	**187**/–

Extra rods, fitted with screws, 24″, **2**/– each; 30″, **2**/**3** each; 36″, **2**/**6** each; 48″, **3**/**3** each.

Fig. 1507A. Set complete with Perfect Patent Lock Joint	**54**/–	**64**/–	**77**/–	**87**/–	**96**/**6**	**109**/**6**	**120**/–	**130**/–	**185**/–	**240**/–

Extra rods with Patent Perfect Lock Joint, 24″, **2**/**9** each; 30″, **3**/– each; 36″, **3**/**3** each; 48″, **4**/– each.

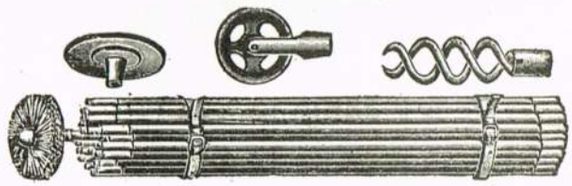


Fig. 1508. THE "CONTRACTORS'" DRAIN CLEANSING MACHINES.

Specially constructed of best quality red malacca canes, with interchangeable brass screws. Price includes brass clearing wheel, double worm screw, 4″, w.c. stout rubber plunger in brass fittings, drain brush and straps.

Length, feet	30	40	50	60	70	80	90	100	150	200
Fig. 1508. Price complete as above, with interchangeable brass screws	**34**/–	**41**/–	**50**/–	**57**/–	**63**/–	**72**/**6**	**80**/–	**87**/–	**125**/–	**163**/**6**

Extra rods, fitted with screws, 24″, **1**/**11** each; 30″, **2**/**1** each; 36″, **2**/**3** each; 48″, **3**/– each.

Fig. 1508A. Price complete, but fitted with Perfect Patent Lock Joint	**46**/–	**55**/–	**67**/–	**76**/–	**85**/–	**97**/–	**106**/–	**115**/–	**166**/–	**218**/–

Extra rods, fitted with Patent Lock Joint, 24″, **2**/**6** each; 30″, **2**/**9** each; 36″, **3**/– each; 48″, **3**/**9** each.

Fig. 1509. THE "PLUMBERS'" DRAIN CLEANSING MACHINE.

Fitted with good quality 36″ malacca canes, double worm screws, wood roller guide, 4″ plunger in brass cup and cap, with straps, with interchangeable brass screws.

Length, feet	30	40	50	60	70	80	90	100
Price complete as above, with interchangeable brass screws ...	**25**/–	**31**/–	**39**/–	**45**/–	**51**/–	**59**/–	**65**/–	**72**/–

Extra rods, fitted with interchangeable brass screws, 24″, **1**/**8** each; 30″, **1**/**10** each; 36″, **2**/– each; 48/″, **2**/**6** each.

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DRAIN TOOLS.

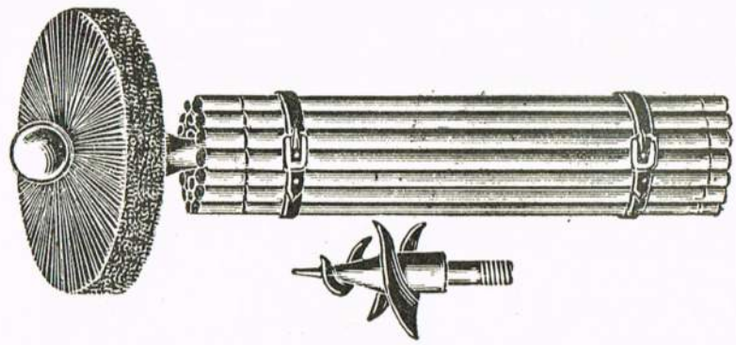

Fig. 1510. THE "SPECIAL" CHIMNEY SWEEPING AND DRAIN CLEARING MACHINE.

Comprising best quality 36″ red malacca canes fitted with best brass screw and sockets, with 18″ brass chimney brush, archimedean screw for drain clearing, and pair of straps.

Length, feet	30	40	50	60	70	80	90	100
Price complete, as above	**30/–**	**37/6**	**47/6**	**55/–**	**62/6**	**72/6**	**80/–**	**87/6**

Fig. 1511. THE "SMALLHOLDER" SET.

For clearing greenhouse and other small flues. Comprising 4 cane rods, each 6 ft. long. Very pliable. Fitted with interchangeable screws; whalebone spiral brush, 4″ or 6″ in diameter; and double worm screws, 1″ in diameter.

Price, as above specification ... ... **14/6** per set.

Fig. 1512. FLEXIBLE STEEL DRAIN RODS.

Comprising 36″ × ⅜″ spiral spring steel, with lock-fast joints. Complete with fittings as shown.

Length, feet	30	40	50	60	70	80	90	100
Price per set	**47/6**	**58/–**	**72/–**	**82/6**	**93/–**	**107/–**	**117/6**	**128/6**

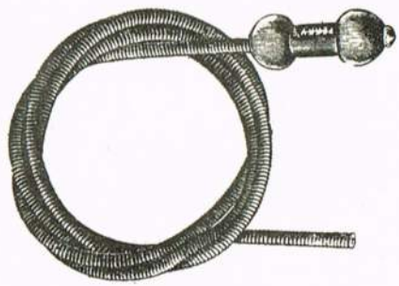

Fig. 1513.
"HOME" LAVATORY BASIN AND BATH CLEARING SET.

Objectionable obstructions are easily and quickly removed by this apparatus.

Length, feet ...	6	9	12	18
Price each	**2/3**	**3/3**	**4/3**	**5/9**

Fig. 1514. INDIARUBBER FORCE PUMPS.

Best moulded rubber, ebonized wood handle and steel guard.

	Price each.
No. 1 size. For basins, sinks, etc. 3½″ diameter ...	**1/6**
No. 2. Medium. For sinks, baths, etc. 4½″ diameter ...	**3/6**
No. 3. For closets and drains, etc. 5½″ diameter ...	**5/6**

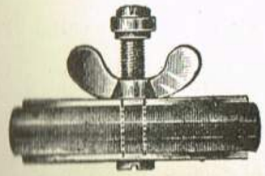

Fig. 1515. EXPANDING DRAIN STOPPERS.

For testing drains, soil pipes, etc. Made in four sizes. The stoppers are made of the finest materials only. Best quality rubber. Galvanised iron and brass wing nut and cap.

Size, inches	4	6	9	12
Price each	**7/6**	**11/6**	**22/6**	**32/6**

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CHIMNEY SWEEPING MACHINES.

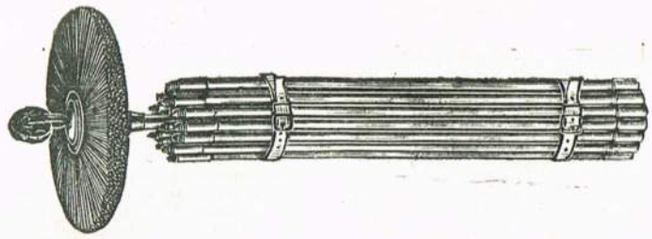

Fig. 1516. BEST QUALITY BROWN MALACCA CANES, with Brass Fittings.

Including 18″ best whalebone head, with large size chimney cloth and cloth slide stretcher.

Length, feet ...	32	40	50	60	70	80	100
Price complete ...	**61/–**	**68/–**	**75/–**	**87/–**	**94/–**	**107/–**	**125/–**

Extra rods, 48″ ... **4/6.**

Fig. 1517. "COMPETITION" CHIMNEY SWEEPING SET.

Comprising rods, straps and brush.

Length, feet ...	30	40	50	60	70	80	90	100
Price per set ...	**32/–**	**40/6**	**49/–**	**57/6**	**66/–**	**74/6**	**83/–**	**91/6**

Extra rods, 60″ long ... **4/3** each.

Fig. 1518. WHALEBONE HEAD, complete with cup and wheel.

Best quality unbreakable whalebone.

ze, inches	10	12	14	16	18	20	22
ice each ...	**11/6**	**12/6**	**13/6**	**15/–**	**16/6**	**20/–**	**23/6**

Fig. 1519. BASS HEAD with cup and wheel.

With heavy double ringed bass and leather washer.

ze, inches ...	10	12	14	16	18	20	22
ice each ...	**8/6**	**9/–**	**9/6**	**10/–**	**10/6**	**11/–**	**11/6**

Fig. 1520.

BASS BRUSHES for Chimney and Drain Clearing.

Size, inches ...	4	6	9	12
Price each ...	**3/–**	**3/–**	**3/6**	**4/–**
Size, inches	...	14	16	18
Price each		**4/6**	**4/9**	**5/–**

Figs. 1521. GENERAL CHIMNEY CLEANING APPARATUS.

No. 44.
Grappling Iron.
5/6 each.

No. 55.
Nest Hook.
2/6 each.

No. 45.
Steel Soot Shovel.
2/6 each.

No. 54.
Bass Turk's Head for Signboards.
6/– each.

No. 48.
Best China Hair Flue Brushes.
Wire handles.

e, inches	48	60	72
ce each	**3/6**	**3/9**	**4/–**

No. 50.
Best Wrought Steel Stove Rake.
40″ long ... **2/6** each.

No. 49.
Sweeps' Brushes. Best Russian.
Flat or round handles.
5/6, 6/3 7/– each.
With Rod Screw fitted, **1/–** each extra.

CABLE RODS.

Cut from best quality canes, for laying electric light and telephone cables. Fitted ½″ Whitworth brass screws and sockets.
36″ ... **2/–** each. 48″ ... **2/3** each. 60″ ... **2/6** each. **72″** ... **2/10** each.
Small double worm, to suit, **2/–** each. Spiral whalebone brush, 1″ to 3″ diameter, **3/–** each.
The above are also suitable for cleaning small waste pipes, greenhouse flues, etc.

Fig. 1522. SELF-ACTING SMOKE CASES for Drain Testing.

1/– each. **11/–** per dozen.

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DRAIN TOOLS.

Figs. 1523. DRAIN TOOLS FOR STANDARD BRASS SCREWS.

No. 10.
Steel Tipped Coring Iron,
3/– each.

No. 11.
Double Clearing Wheel.
7/– each.

No. 12.
Spring Hook.
5/6 each.

No. 8.
Double Worm Screw.
2/6 each.

No. 7.
Double Worm Screw
with guide wheel.
7/6 each.

No. 9.
Coring Iron with wheel.
7/– each.

No. 13.
Archimedian Screw.
3/– each.

No. 14.
Gun-metal Roller.
3/– each.

No. 15.
Fixed Scraper.
4″, **2/3**; 6″, **2/9.**

No. 16.
Jointed Scraper.
4″, **2/6**; 6″, **3/-.**

No. 17.
New Pattern Jointed Scraper,
With guide wheel.
7/6 each.

No. 18.
Brass Clearing Wheels.
2/6 each.

No. 19.
Universal Roller.
5/6 each.

No. 20.
Indiarubber Plunger,
with leather for w.c.'s.
4″, **2/6**; 5″, **3/3**;
6″, **4/–.**

No. 21.
Whalebone or Steel Wire Brush,
in brass fittings.

4″ or 5″	6″	8″	9″
6/6	**7/–**	**8/6**	**10/-**

Fig. 1524. FLEXIBLE CANE RODS.

Very pliable. For use in sharp bends and inaccessible places in drains or Chimneys

	36″ long	48″ long
Price, with ordinary screw joint	**4/–** each ...	**4/9** each
Price with locking joint	**5/–** „ ...	**5/9** „

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FORGES.

Fig. 1525.
Circular Fan Forge.

Fig. 1525. Circular Fan Forge, represents a useful forge for odd work: The pan is built of heavy plate. The gears are helical cut, running in a bath of oil.

Size	A	B	C	D
Diameter of pan, inches	18	20	22	24
Price each	**£4 12 6**	**£4 15 0**	**£5 0 0**	**£5 10 0**

Extra cost on each forge for Bottom Blast Tuyere, **7/6**.

Fig. 1526. A powerful, rigidly constructed **Fan Forge**, with back-blast tuyere iron. Gears are helical cut, running in a bath of oil.

Size	A	B	C	D	E
Size of pan	24 × 18	26 × 20	28 × 22	30 × 24	34 × 26
Price each	**£4 17 6**	**£5 0 0**	**£5 5 6**	**£5 12 6**	**£6 5 0**
Price each with half-hood	**£5 15 0**	**£6 0 0**	**£6 8 0**	**£6 17 6**	**£7 12 6**

Extra cost on each forge for Bottom Blast Tuyere, **7/6**.

Treadle can be fitted to above machine at an extra cost of **£1** each.

Fig. 1526.
Rectagonal Fan Forge.

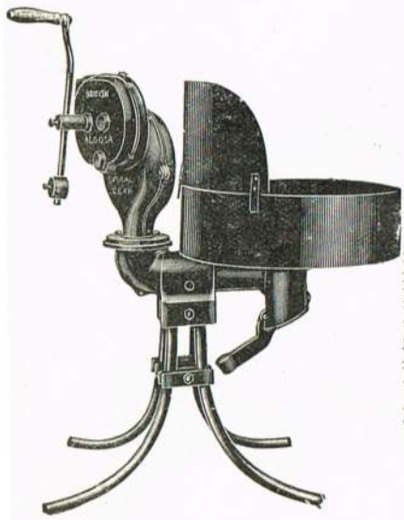

Fig. 1527.
Fitters' Forge, Circular Pattern.

Fig. 1527. Circular Pattern Fitters' Forge, fitted with detachable back shield. 10″ diam. fan, and plain bearings.

Size	Diam. of pan	Price each
A	18″	**£5 6 6**
B	20″	**£5 12 6**
C	22″	**£6 2 6**
D	24″	**£6 10 0**

Fitted with ball bearing and Spiral Gear Blower, **£1 5 0** each extra.

Fig. 1528. Rectangular Pattern Fitters' Forge fitted with back shield. A very strong portable forge, specially constructed for hard wear. Nos. 1 and 2 fitted with 10″ fans; No. 3 with 12″ fan.

No.	A	B	C
Size of pan, inches..	24 × 24	30 × 24	36 × 30
Price each	**£9 2 6**	**£10 2 6**	**£12 0 0**
Extra for detachable full smoke hood ...	**£1 5 0**	**£1 12 6**	**£2 5 0**
Price each if fitted with ball bearings	**£10 12 6**	**£11 12 6**	**£13 0 0**

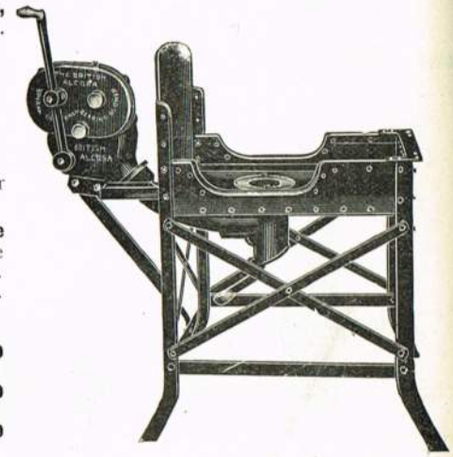

Fig. 1528.
Fitters' Forge, Rectangular Pattern.

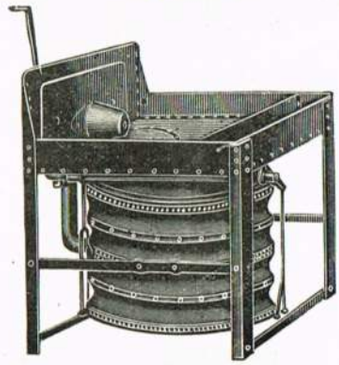

Fig. 1529. Rectangular Portable Single-Blast Pattern.
Very strong and powerful bellows.

Size	Length inches	Width inches	Height inches	Bellows diam. inches	Price each	Extra Half-hood
A	27	22	34	22	**£8 8 0**	**29/9**
B	29	24	34	24	**£9 4 0**	**31/6**
C	33	26	34	26	**£10 0 0**	**32/9**
D	35	28	34	28	**£11 4 0**	**35/–**
E	36	30	36	30	**£12 16 0**	**37/–**

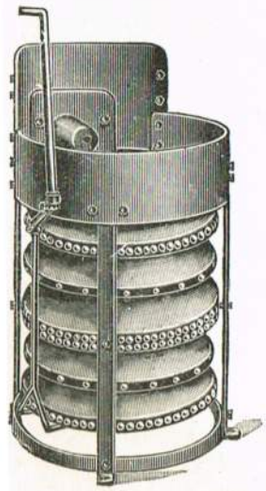

Fig. 1530/1.

Fig. 1530. Circular Single-Blast Rivet Forges.

Size	A	B	C	D	E
Diam. of pan, inches	18	20	22	24	26
Height, inches	26	28	32	32	32
Diam. of bellows, inches	16	18	20	22	24
Price each....	**76/6**	**80/–**	**88/–**	**90/–**	**132/–**

Extra, **5/–** each for Foot Treadle.

Fig. 1531. Circular Double-Blast Pattern.

Price each....	**128/–**	**152/–**	**160/–**	**176/–**	**192/–**
Weights extra	**10/–**	**10/–**	**12/9**	**14/6**	**19/6**
Hood extra	**23/6**	**23/6**	**23/6**	**30/–**	**30/–**

Height of all Double-Blast Forges is 33″.

Ffg. 1532. Cast Iron Spiral Geared Fan Forge, 18″ diameter pan, 6″ fan. Gears run in oil. Complete as shewn, **81/6** each.

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FORGES.

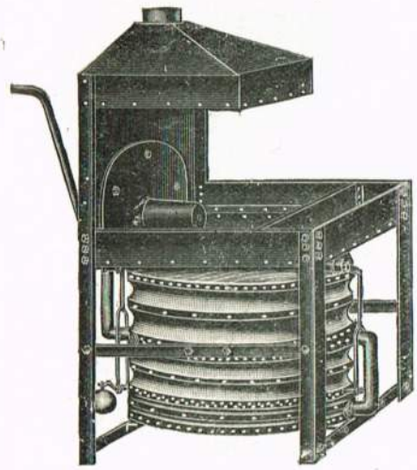


Fig. 1533. Smith's Forge. Heavy extra powerful **Double** Blast Forge.

Size	Bellows diam. ins.	Height ins.	Price each	Weights extra	Full Smoke Hood extra
A	22	36	**11 14 0**	**14/6**	**52/–**
B	24	36	**12 0 0**	**19/6**	**52/–**
C	26	36	**13 12 0**	**19/6**	**72/–**
D	28	36	**14 8 0**	**21/–**	**72/–**
E	30	36	**16 8 0**	**21/–**	**72/–**

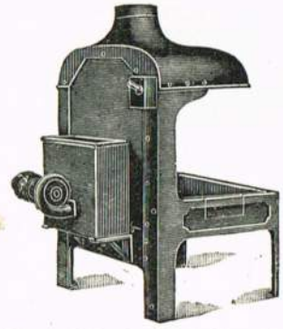


Fig. 1534. Smiths' Hearths.

Showing No. 1 Fan and Motor Set fitted to Hearth.

Constructed of cast iron except back plate of heavy plate. Deep recessed bottom, moveable gap pieces, breast plate and extra large back, blast water, bosh and tuyere.

Size	Dimensions	Price each
A	30×30×6″	**£20 10 0**
B	36×36×6″	**£22 0 0**
D	42×42×6″	**£25 10 0**
E	48×48×6″	**£28 0 0**
F	72×42×6″ (double)	**£35 10 0**

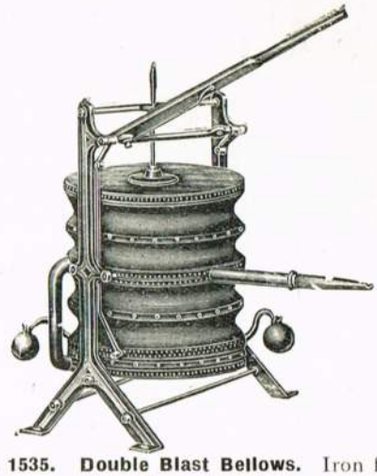


Fig. 1535. Double Blast Bellows. Iron frame. Complete with weights.

Size	A	B	C	D	E
Diam. of bellows ins.	18	20	22	24	26
Price each	**115/–**	**132/–**	**154/–**	**176/–**	**198/–**
Weights	**10/6**	**10/6**	**13/–**	**13/–**	**15/–**

Size	F	G	H	I
Diam. of bellows, ins.	28	30	32	34
Price each	**230/–**	**268/–**	**300/–**	**357/–**
Weights	**15/–**	**15/–**	**22/–**	**22/–**

Size	J	K	L	M
Diam. of bellows, ins.	36	38	40	42
Price each	**400/–**	**454/–**	**520/–**	**590/–**
Weights	**22/–**	**22/–**	**22/–**	**26/6**

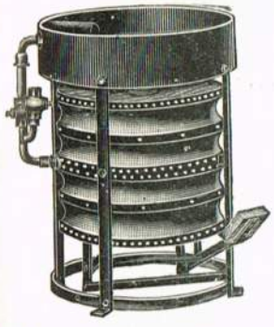


Fig. 1536. Improved Circular Combination Forge and Brazier.

Size	Diam. of pan ins.	Diam. of bellows ins.	Price each as shewn	Price each without tuyere
A	20	18	**112/–**	**95/–**
B	22	20	**120/–**	**97/6**
C	24	22	**140/–**	**130 –**

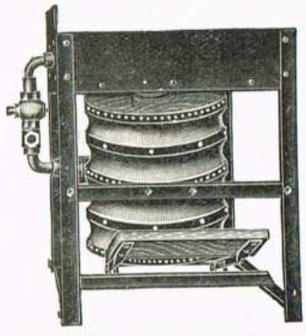


Fig. 1537. Improved Square Combination Forge and Brazier.

Size	Diam. of pan ins.	Diam. of bellows ins.	Price each
A	20×20	20	**152/6**
B	24×24	24	**192/6**

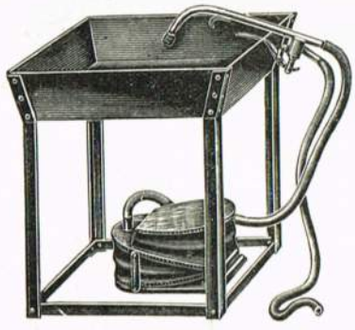


Fig. 1538. Rectangular Brazing Pans.

A—has short legs for bench use.

F and G—fitted with shelf beneath pan.

Bellows and blow-pipe extra.

Size ...	A	B	C	D	E	F	G
Diam. of pan inches	24×18 ×6	24×18 ×6	24×18 ×8	28×22 ×8	32×28 ×8	27×21 ×8	36×36 ×9
Suitable Bellows, inches	10	10	10	12	14	12	16
Suitable Blow-pipe, inches	¾	⅞	1	1⅛	1¼	1⅛	1¼
Price, each	**31/–**	**40/–**	**47/6**	**65/–**	**72/6**	**72/6**	**112/6**

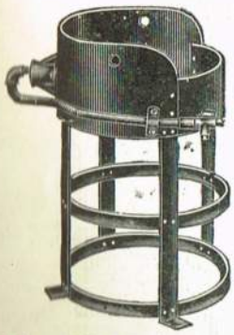
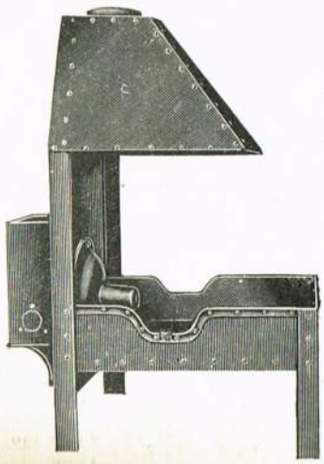


Fig. 1539. Compressed Air Rivet Forge.

Special design tuyere.

Size	A	B	C
Diam. of pan, in.	18	20	22
Price, each	**150/-**	**156/-**	**165/-**



Shows hearth fitted with left-hand side blast, bosh, and tuyere.

Fig. 1540. IMPROVED STEEL PLATE.

Smith's Hearth constructed of heavy steel plate and angles, cast-iron breast plate, cast-iron water bosh, and 12 in. tuyeres. Right or left hand side blast connections can be supplied at an extra cost of **17/6** per bosh. All these Hearths can be fitted with hinged hood for tyring at small extra cost.

Size	A	B	C
	30×30×6	36×36×6	42×42×6
Price	**£16/15**	**£18/15**	**£21**

Size	D	E	F
	48×48×6	72×42×6	72×48×6
Price	**£22/10**	**£36**	**£38/10**

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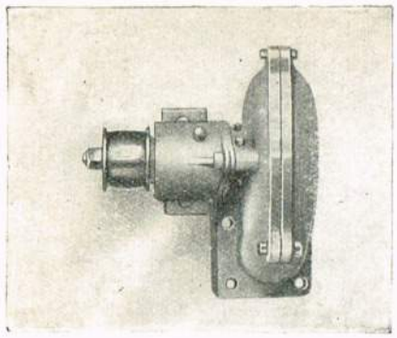
ANVILS, Etc.



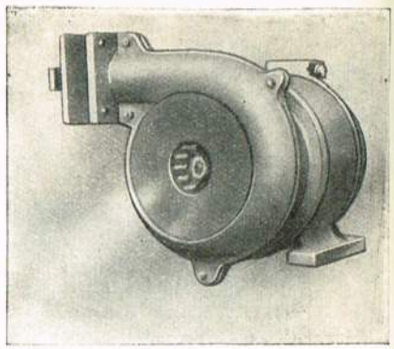
No. 1 Pattern for Belt Drive.
For bolting direct to hearth.

Fig. 1541.

Motor Driven Fan Sets for fitting to Smiths' Hearth.

They are supplied with Universal Couplings, and can be fitted in four positions. The Motors are of $\frac{3}{8}$-h.p. total enclosed type, series wound. All sets are supplied with non-automatic regulators with six steps for variable speeds.

Will blast for one $1\frac{1}{4}''$ tuyere or two $\frac{7}{8}''$ tuyeres.



No. 1a Pattern for Motor Drive.
Position for bolting to floor.

	Fan with pulley	No. 1 Fan and Motor D.C. 100/250 volts	D.C. 250/500 volts	No. 1a Fan and Motor A.C. single phase 200/250 volts	A.C. single phase 400/500 volts
No. 1	**£7 0 0**	**£20 13 6**	**£22 15 0**	**£22 10 0**	**£24 10 0**
Slide Valve, to suit	**£1 7 0**	**£1 7 0**	**£1 7 0**	**£1 7 0**	**£1 7 0**
Price for fixing to water bosh of hearth, back blast....	**£1 2 6**	**£1 2 6**	**£1 2 6**	**£1 2 6**	**£1 2 6**
Ditto, side blast including angle bracket	**£2 0 0**	**£2 0 0**	**£2 0 0**	**£2 0 0**	**£2 0 0**

Fig. 1542. Gas Brazing Blow-Pipes, fitted with improved valve. Hard brazed joints.

Size, ins	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Air connection	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Gas connection	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Price	**15/–**	**16/–**	**17/6**	**19/–**	**22/–**	**24/6**	**26/–**	**27/–**	**32/–**
Tubing to suit	**12/6**	**15/6**	**18/–**	**18/–**	**22/6**	**22/6**	**24/6**	**28/–**	**33/6**

Tubing is armoured inside, and the above price is for 10ft. length.

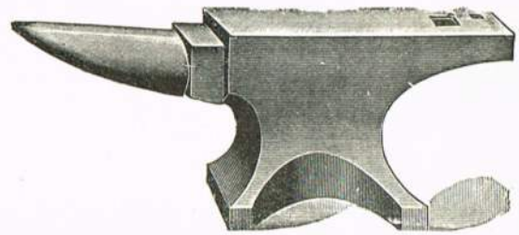


Fig. 1543. Blacksmiths' Anvils.

A.	Warranted quality .	**65/–** per cwt. for $1\frac{1}{4}$ cwt. and up.		
B.	Best warranted quality	**70/–**	,,	,,
C.	Solid wrought quality	**72/6**	,,	,,

Fig. 1544. Boshes with Patent Detachable Tues.

Size	Length inches	Depth inches	Width inches	The Iron inches	Price each
A	18	18	7	13×1	**80/–**
B	22	$21\frac{1}{2}$	8	$14 \times 1\frac{1}{8}$	**94/–**
C	24	$22\frac{1}{2}$	10	$15 \times 1\frac{1}{4}$	**102/6**
D	24	$22\frac{1}{2}$	10	$18 \times 1\frac{3}{4}$	**107/6**
E	24	$22\frac{1}{2}$	10	$20 \times 1\frac{1}{2}$	**112/6**

Fig. 1548.
Blast Standards, 22″ from floor to centre of outlet, Stand Pipe and Cock, 3″ outlet
£3 0 0

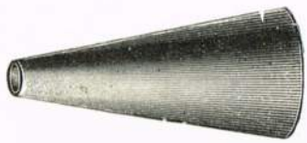


Fig. 1546. Blacksmiths' Mandrels.

Size	A	B	C
Height, ins.	30	36	54
Diam. top, ins.	3	3	3
Diam. bottom, ins.	18	24	30
Price each	**65/–**	**157/–**	**275/–**

Fig. 1545. Solid Best Cast Iron Tyring Plate.
35/– per cwt.

Fig. 1547. Cast Iron Swage Blocks and Stands. 20/- per cwt.

Size	Dimensions inches	Weight of block. c. q. lbs.	Weight of stand c. q. lbs.
A	$9 \times 9 \times 3$	0 2 0	0 3 0
B	$12 \times 12 \times 4$	1 0 0	1 2 0
C	$13 \times 13 \times 4$	1 0 14	1 3 0
D	$13 \times 13 \times 6$	1 2 7	1 3 0
E	$14 \times 14 \times 4\frac{1}{2}$	1 2 0	2 0 0
F	$15 \times 15 \times 5$	2 0 0	2 0 0
G	$16 \times 16 \times 6$	2 2 0	2 0 11
H	$18 \times 18 \times 6$	3 1 18	2 3 0
I	$20 \times 20 \times 7$	4 2 7	3 0 14

Fig. 1549. Anvil Stand.
Made to suit anvil base.
25/– per cwt.

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BLOW PIPES.

These blowpipes are the most powerful ever made for their size and weight.

Fig. 1550. Without Tap.

Gas supply, $\frac{3}{8}''$;	length $10\frac{1}{4}''$;	Price **10**/– each.
,, ,, $\frac{1}{2}''$;	,, $12\frac{1}{2}''$;	,, **13/6** ,,
,, ,, $\frac{3}{4}''$;	,, $19''$;	,, **37/6** ,,
,, ,, $1''$;	,, $24\frac{1}{2}''$;	,, **67/6** ,,

Fig. 1551. With Tap.

Gas supply, $\frac{3}{8}''$;	length $10\frac{1}{4}''$;	Price **19/6** each
,, ,, $\frac{1}{2}''$;	,, $12\frac{1}{2}''$;	,, **25**/– ,,
,, ,, $\frac{3}{4}''$;	,, $19''$;	,, **47/6** ,,
,, ,, $1''$;	,, $24\frac{1}{2}''$;	,, **83**/– ,,

Foot Blower, No. 3 size, will work the $\frac{3}{8}''$ size Blowpipe at full power. No. 5 size will work the three smaller sizes; for the 1″ a blower driven by power, or a smiths' bellows, will be required.

The gas and air tubes of any pattern of blowpipes can be made any length required, to suit special trades, at a small additional cost.

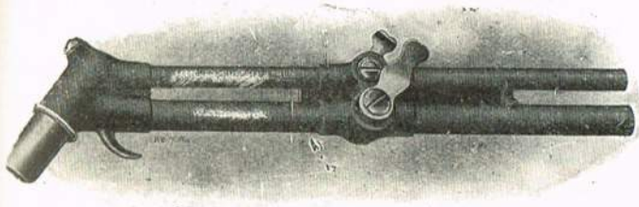

Fig. 1552. With Gas and Air Tubes.

Gas supply, $\frac{1}{2}''$; length, 13″; Price **22**/– each.

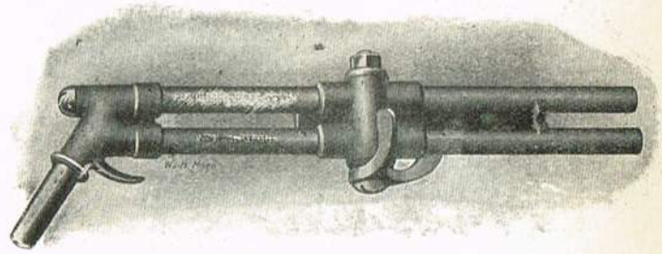

Fig. 1553. With Tap.

Gas supply, $\frac{3}{8}''$; length, $10\frac{1}{2}''$; Price **13**/– each.

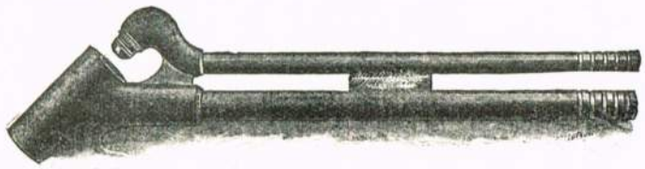

Fig. 1554. INJECTOR BLOWPIPE.

Very powerful, and light enough to use with one hand freely on large work. For $\frac{5}{8}''$ gas supply and $^{7}/_{16}''$ air. Length $15\frac{1}{2}''$.

Price ... **27/6**.

With taps length $16\frac{1}{2}''$, price **35**/– each.

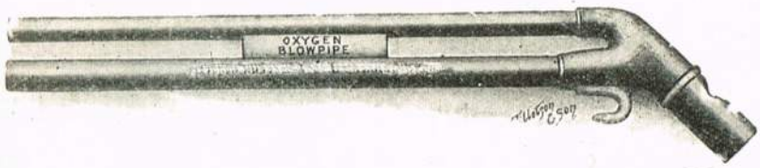

Fig. 1555. OXYGEN BLOWPIPES.

For use with compressed oxygen.

No. 7.—Gas supply $\frac{1}{4}''$; length $3\frac{3}{4}''$. Price without taps, **9**/–; with taps, **24**/– each.

No. 20.—Gas supply $\frac{3}{8}''$; length 12″. Price without taps, **13/6**; with taps, **28**/– each.

No. 40.—Gas supply $\frac{1}{2}''$; length $14\frac{1}{2}''$. Price without taps, **16/6**; with taps, **32**/– each.

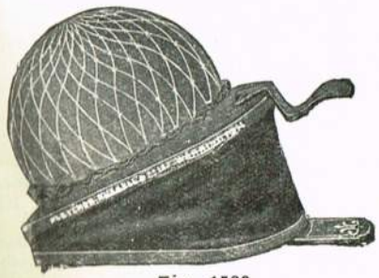

Fig. 1560.

STEADY-PRESSURE BELLOWS.

Air pressure, $1\frac{1}{4}$ lb. square inch.

No. 3.—Size overall 13″ × 10″ × $6\frac{1}{2}''$; pressure in water, 36″; pressure in ozs., 20 on square inch; air pipe $\frac{3}{8}''$. Price **55/-**.

No. 9.—Size overall 15″ × 12″ × 7″; same pressures; air pipe $\frac{3}{8}''$. Price **60/-**.

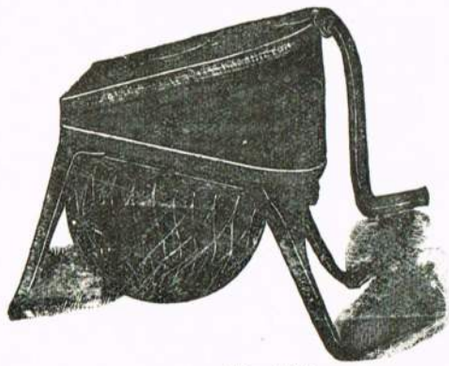

Fig. 1561.

Same dimensions as Fig. 1560, Nos. 3 and 9, but reversed on stand.

Prices, **No. 3, 60/-**; **No. 9, 65/-** each.
Extra rubber discs, **No. 3, 2/3.**
No. 9, 2/9.

Extra nets, **No. 3, 2/3**; **No. 9, 3/6.**
Two rubber discs to each blower.

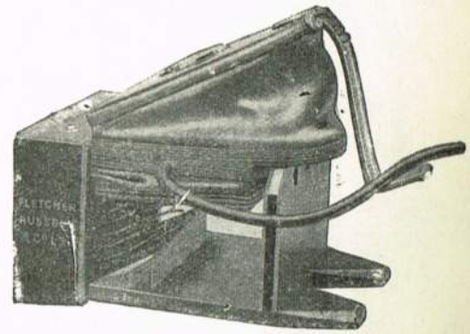

Fig. 1562.

FOOT BLOWER.

With spring reservoir in place of india-rubber disc.
Does not give steady pressure.
Same dimensions as Fig. 1560.

Price, **No. 3** ... **90/-** each.
No. 9 ... **100/-** ,,

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GAS SOLDERING IRON STOVES AND BOILERS.

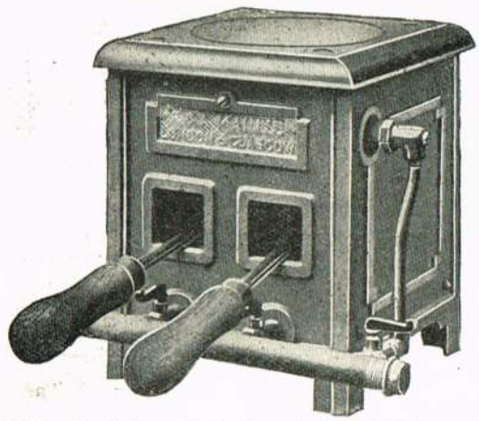

Fig. 1570. Workshop Soldering Iron and Gluepot Heater. Size 9″ wide × 9″ deep × 10½″ high. ½″ gas supply pipe. Price ... **£2 15 0** each.

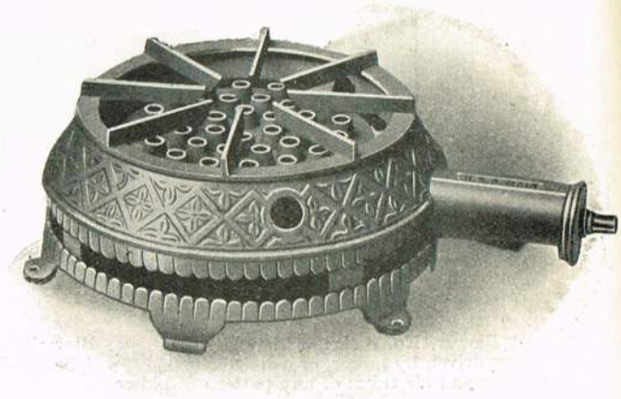

Fig. 1571. High Power Gas Burner. Diam., 14″; length 19″; height, 5½″; ¾″ gas pipe. Price each ... **30/–**.

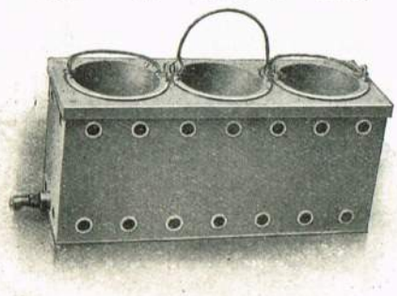

Fig. 1572. Gluepot Heater. Galvanized iron casing and porcelain enamelled cast iron gluepots.

ze.	Wide	Deep	High	No. of pots.	Price each.
ı	16″	8″	8″	3	**£2 15 0**
3	23″	8″	8″	2	**£3 5 0**

Fig. 1573. Boiling Ring. Width, 6½″; length, 11½″; height, 3″. Price ... **3/9** each.

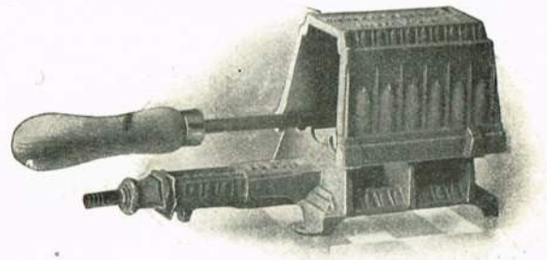

Fig. 1574. Single Soldering Iron Heater, with removable cast iron cover. Price **12/6** each.

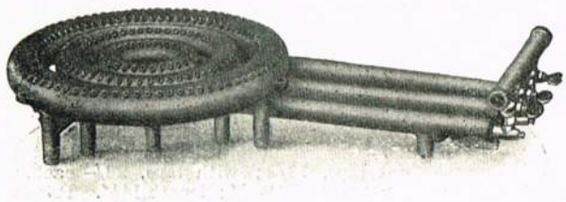

Fig. 1575. Triple Concentric Boiling Burner. Length over all, 27″; height 4¾″; bore supply, ¾″ gas. Price **35/–**.

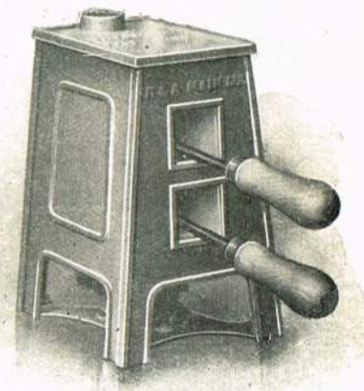

Fig. 1576. Workshop Soldering Iron Heater, lined with fireclay bricks. Size 6½″ wide × 8¼″ deep × 11″ high. ½″ gas supply pipe. Price ... **20/6** each.

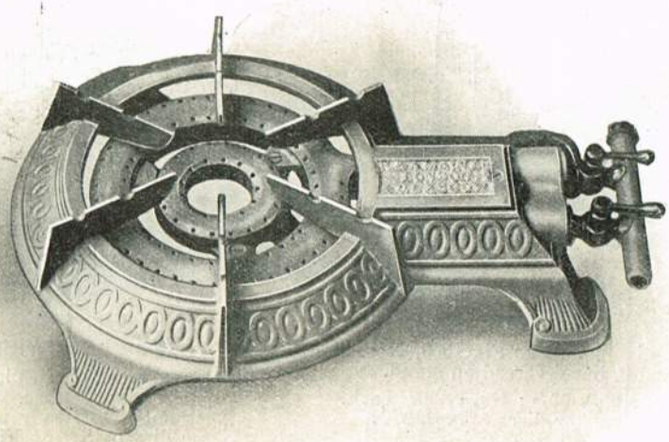

Fig. 1577. Powerful Concentric Burner, with rail and two stop-cocks. Diam, 14″; length over all, 20½″; height, 4½″; supply, ¾″ gas. Consumption—small ring, 16 ft. per hour; large ring, 40 ft. per hour. Price **32/6** each.

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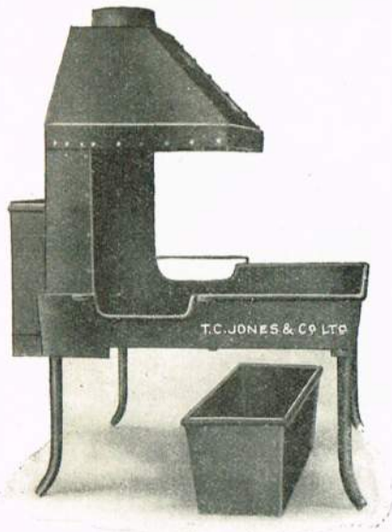
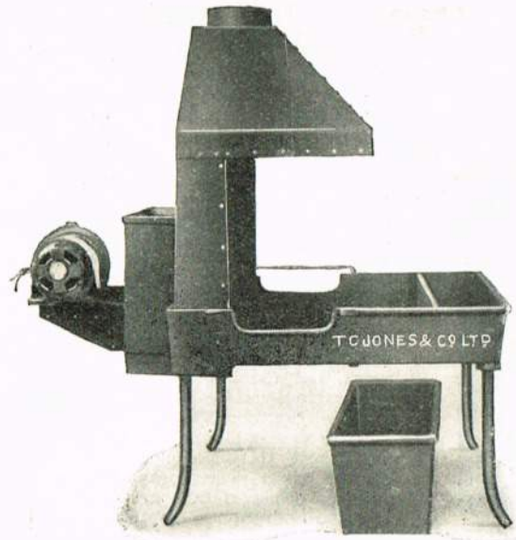
FORGES.





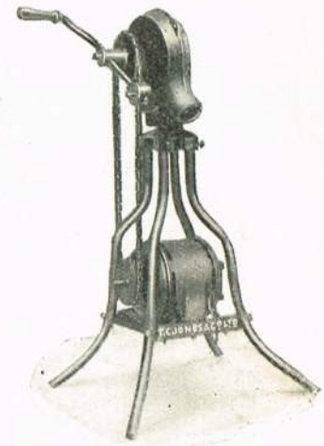


Fig. 1578. New Pattern Smiths' Hearths. Cast-iron mounted on 2 inch diameter tubular steel legs, which are unbreakable. The two designs above show this hearth with and without electric motor driven blast. The ordinary bellows can be used as well as the new design Portable Motor, Fig. 1579.

They are fitted with sunk well under nose of tue iron, cast-iron water tue iron with or without wrought-iron hood, back or bottom blast, heavy cast-iron fire back. Hearths fitted for bottom blast are supplied with a heavy well shaker grate tue for 3½″ air supply. Hoods have 9″ chimney opening.

No. 1.	Size of hearth 36″ × 36″	Price **£8 2 6**	Extra for hood,	**£1 17 6**	each.
No. 2.	,, ,, 42″ × 36″	,, **£8 7 6**	,, ,,	**£1 19 6**	,,

Extras.

Cast-iron slack and water trough, **25/-.** Ditto. with angle iron stand, **45/-.**
Gun metal bearing blowing fan for power with 2½″ pulley for 1¼″ belt **£2 10 0**
Ball bearing ,, ,, ,, 2½″ ,, 1¼″ ,, **£3 4 6**
Ball bearing ,, ,, ,, 2½″ ,, 1¼″ ,, **£5 11 6**
Also extra fixing brackets recommended for high speed.
Slide Valve extra **20/-.** Extra for fitting all blowers to hearths, **15/-** each.

¾-H.P. Motor Fan Sets for above, with Starter.

Single phase.		2 or 3 phase.	
100/250 D.C.	250/500 D.C.	200/250 A.C.	400/500 A.C.
£14 7 6	**£15 12 6**	**£15 0 0**	**£16 4 0**

Fig. 1579. New Design Portable Motor or Hand-driven Fan mounted on tubular stand for use with Smiths' Hearths. A unit which can be fitted in any desired position, with detachable handle, 10″ diam. ball-bearing fan; 1½-H.P. Motor. Series wound any voltage. Complete with pulleys and patent belt, speeds 2,800 to 4,800 r.p.m.

Price **£13 2 3.**
Starter **£1 17 6.**

Blower can be supplied as shown but without motor.

Price **£6 9 0,** or with 12″ Fan instead of 10″ **£8 14 0.**

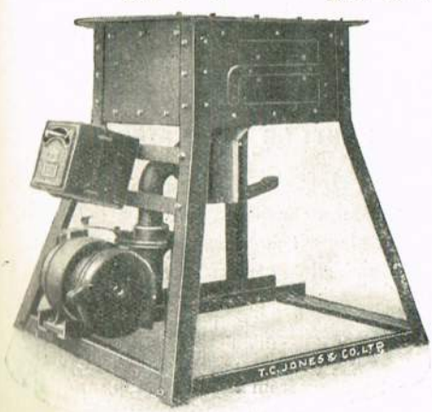


Fig. 1580. Latest Pattern Motor-driven Copper Smiths' Hearth. Built up of heavy steel plate 30″ × 30″ in either square or round, lined with fire bricks, with a fire space 9″ × 9″. Fitted with ¾-H.P. motor and starter, slide valve ash trap, top and bottom blast tuyere.

Price **£28 2 6**

The above can be supplied with motor to suit any voltage, or with side blast tuyere, if required.

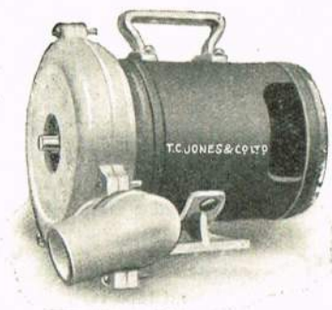


Fig. 1581. Portable Electric Motor Blower. An effective and convenient method of blowing dust out of motors, dynamos, and machinery, also suitable for conveying dust from small machines in the form of an exhaust. The outlet nozzle has a swivel joint and can therefore be turned to any angle.

H.P.	D.C. Voltage 100/250	250/500	A.C. Voltage 200/250	400/500
¼	**£10 7 6**	**£11 9 0**	**£11 8 0**	**£12 7 0**
¾	**£11 8 0**	**£11 17 6**	**£11 16 6**	**£12 16 0**
½	**£12 10 0**	**£12 19 0**	**£12 19 0**	**£13 12 0**

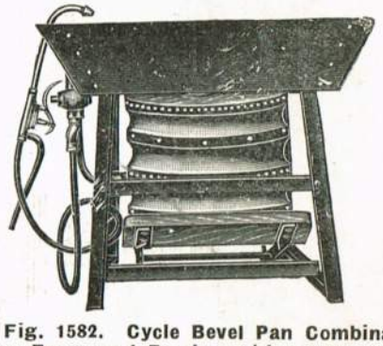


Fig. 1582. Cycle Bevel Pan Combination Forge and Brazier, with tuyere and blow-pipe connection and treadle.

No. ...	0	1	2	3
Size of pan inches..	24 × 21 × 9	30 × 21 × 9	34 × 26 × 9	34 × 26 × 9
Diam. of Bellows inches..	18	20	22	24
Suitable Blowpipe inches..	⅞	1	1⅛	1¼
Price each ...	**£7 12 6**	**£8 8 0**	**£9 10 0**	**£10 10 0**

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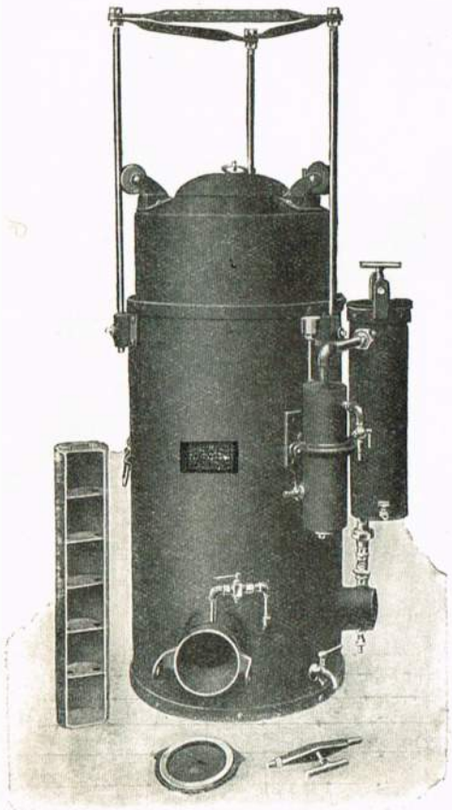
AUTOMATIC ACETYLENE GENERATORS.



Design for Sizes W1 and W2.

Figs, 1590.

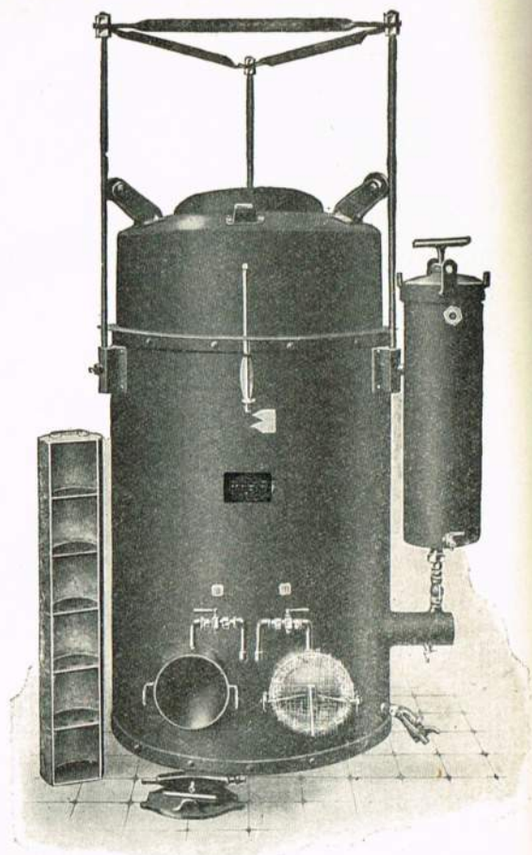
PORTABLE AND STATIONARY MODELS.

The Portable type is specially recommended for ship repair work, as it is easily transported from place to place. Also for use over tramway systems and in workshops where welding and cutting operations have to be carried out *in situ*. It has been designed with great care and with a view to being self-contained, compact, reliable, easy to clean, and produces sufficient gas for intermittent work, but the larger sizes are preferable where long continuous operations are required.

Their perfect simplicity, combined with thorough efficiency, renders these generators quite safe for transportation, and we have no hesitation in commending them to the consideration of our friends.

These generators are manufactured in seven capacities, all made on the same principle, which cannot under ordinary conditions get out of order. The generation commences and stops automatically when sufficient gas has been made, consequently there is no waste.

Supplied complete with Hydraulic Safety Valve.



Design for Sizes W3, W4, and W5.

Model No.			Carbide charge.	£ s. d.	Extra Purifiers.	
W1.	Portable Set, with	1 generating chamber	6 lbs.	**13 15 0** each	**£3 0 0**	
W2.	,, ,,	1 ,, ,,	10 lbs.	**15 15 0** ,,	**3 15 0**	Charged
W3.	,, ,,	2 ,, ,,	12 lbs.	**17 10 0** ,,	**4 0 0**	with
W4.	Stationary Set with	2 ,, ,,	24 lbs.	**24 10 0** ,,	**5 0 0**	Patent
W5.	,, ,,	2 ,, ,,	45 lbs.	**34 10 0** ,,	**6 10 0**	Purifying
W6.	,, ,,	3 ,, ,,	70 lbs.	**48 10 0** ,,	**8 0 0**	Materials.
W7.	,, ,,	2 ,, ,,	112 lbs.	**120 0 0** ,,	**14 0 0**	

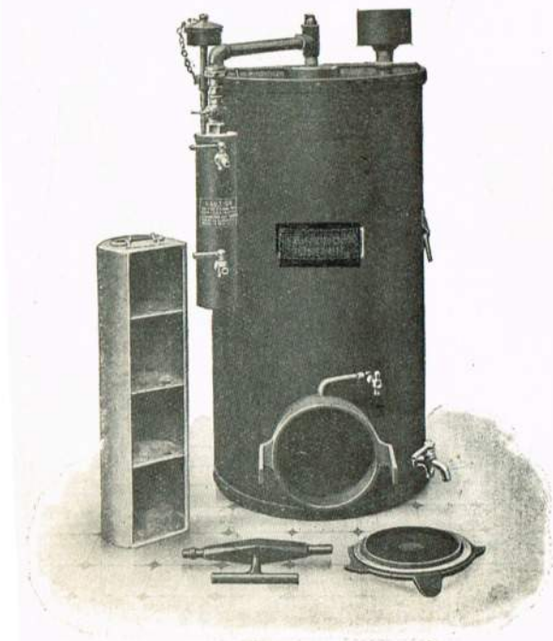


Fig. 1591. (No. W50).

PORTABLE ACETYLENE CUTTING GENERATOR.

Carbide Charge, 9–10 lbs. Height overall, 36 inches.

This Generator meets the demand for a cheap and efficient article, and is mainly used for cutting in boiler shops, shipyards, metal works, etc., and is strongly made of sheet steel, welded together, and galvanised after construction.

Fill the tank until the water just covers the fixed bell inside, keeping all taps turned off. Then fill the hydraulic safety valve, attached to the side of the generator, until the water drips from the lower tap, and add a little more each morning to keep the water to this level.

Place carbide in container until each compartment is nearly half full, and then replace container and screw up front plate.

To start the generator turn on tap above the carbide chamber for a few seconds, and then turn off, as the water should rise about 6 inches and become stationary. Then turn tap on again, and the generator is ready for use. This tap being screw-seated you can, by half or full turn, regulate the water passing through to carbide, according to the volume of gas required.

Price complete ... **£14 15 0.**

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ACETYLENE BLOW-LAMPS, ETC.

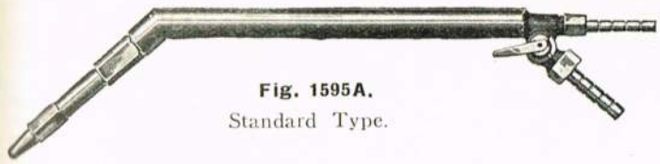


Fig. 1595A.
Standard Type.

Fig. 1595B.
Light Design.
One tap controlling acetylene.

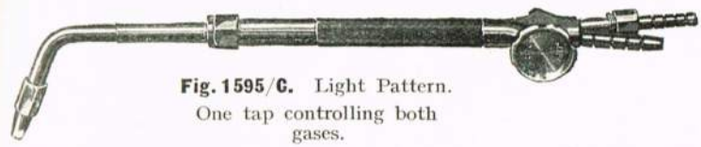
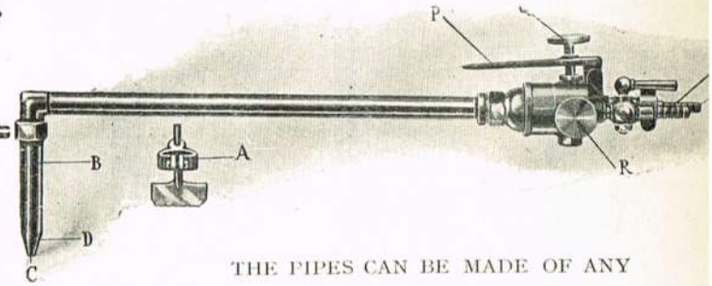


Fig. 1595/C. Light Pattern.
One tap controlling both gases.

Fig. 1595D. Metal-Cutting Blowpipe.
For cutting up to 6″ thick.
£8 5 0.



THE PIPES CAN BE MADE OF ANY CAPACITY AND IN ANY TYPE SHEWN ON THIS PAGE.

The Table given below will enable customers to select the most suitable sizes for their requirements.

No.	Thickness of Metals to be Welded.	Approx. Oxygen Pressure req.	Foot run per hour.	Approx. Consumption per hour. Oxygen.	Acetylene.
10	$^1/_{32}$″ to $^1/_{20}$″	5 lbs.	30 ft.	3 ft.	3 ft.
11	$^1/_{20}$″ to $^1/_{16}$″	6/7 lbs.	25 ft.	4 ft.	3 ft.
12	$^1/_{16}$″ to $^3/_{16}$″	7/8 lbs.	20 ft.	10 ft.	8 ft.
13	$^3/_{16}$″ to $^5/_{16}$″	13/14 lbs.	10 ft.	16 ft.	12 ft.
14	$^3/_8$″ to $^1/_2$″	21/22 lbs.	6 ft.	35 ft.	30 ft.
15	$^5/_8$″ to $^3/_4$″	27 lbs.	3 ft.	55 ft.	50 ft.
16	about 1″	30 lbs.	2 ft.	90 ft.	80 ft.
17	$1^1/_4$″ to $1^1/_2$″	35 lbs.	2 ft.	100 ft.	90 ft.
18	$1^1/_2$″ to 2″	40 lbs.	1 ft.	125 ft.	100 ft.

PRICES.

WELDING BLOWPIPES.

No.			£ s. d.
10	Any design	each	**2 10 0**
11	,, ...	,,	**2 15 0**
12	,, ...	,,	**2 15 0**
13	,, ...	,,	**3 0 0**
14	,, ...	,,	**3 0 0**
15	,, ...	,,	**3 10 0**
16	,, ...	,,	**4 0 0**
17	,, ...	,,	**4 10 0**
18	Specially useful for heavy copper work....	,,	**5 0 0**
	Interchangeable Blowpipes made up in series of any sizes	per set	**6 0 0**

AUTOMATIC REGULATORS.

These automatic regulators are of substantial construction. They are highly efficient and reliable in use and capable of reducing the high and varying pressures of oxygen down to zero. They are fitted with two gauges, one showing the working pressure at blow-pipe, and the other registers the pressure of oxygen in cylinder. The contents gauge can be employed to check the contents of cylinders when they arrive from the compressing factory, also to avoid starting a job with insufficient oxygen to complete it. No. 1 is capable of giving a working pressure up to 75 lbs. per square inch, which is more than ample for all sizes of welding blowpipes, also for general cutting use. For the high working pressure necessary for the cutting of thicker metals No. 2 size is used, which is specially strong and will deliver the oxygen at any required pressure up to 240 lbs. per square inch.

When the blowpipe is not in use it is desirable to shut the oxygen cylinder valve also, in order to avoid all possibility of loss through leakage and to release the internal parts of the regulator and its gauges from needless pressure.

Fig .1600/A. For use with welding blowpipe and thinner cutting .... each **£3 5 0**

Fig. 1600/B. For use with cutting thick metals each **£4 10 0**

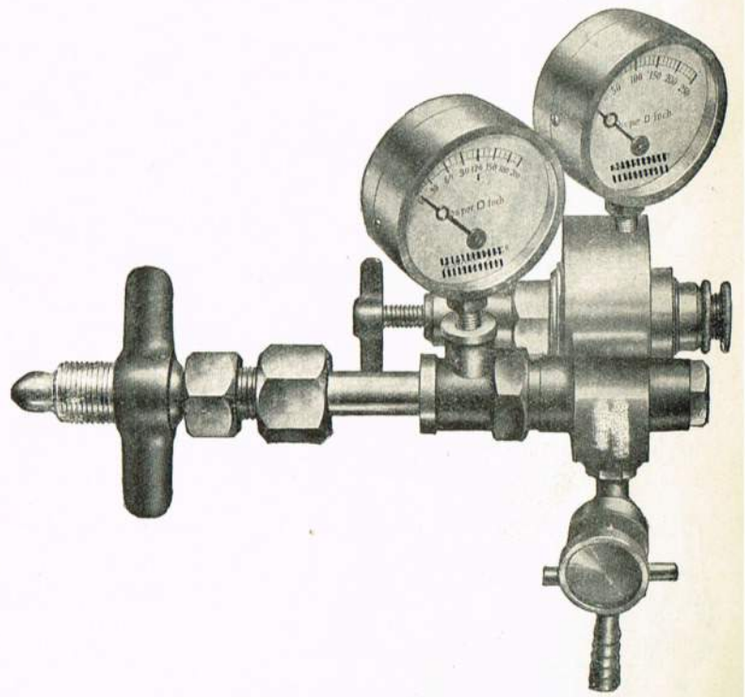


Fig. 1600/1 to 8. SUNDRY ACCESSORIES.

No.		
1—Special rubber hose for oxygen .... per ft.	**1/–**
2—Special indiarubber tubing for acetylene .... ,,	**1/–**
3—Tinted spectacles for operator .... per pair	**3/–**
4—Tinted goggles for operator, superior make ,,	**5/–**
5—Cylinder keys for operator .... each	**2/–**
6—Special cast iron sticks for welding cast iron per lb.	**–/6**
7—Special iron wire for welding steel or iron plate— According to size and quantity required	
8—Special fluxes for cast iron, copper, etc. .... per lb.	**2/6**

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BLOW LAMPS, PUMPS, ETC.

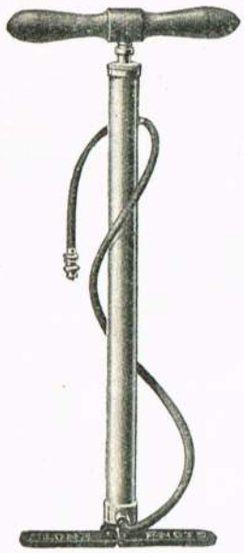


Fig. 1611.
Pold Brass Motor Car **Folding Foot Pump.**
18″ × 1¼″.
Price **18/6** each.

Fig. 1612.
Pold Brass Motor Cycle **Foot Pump.**
15″ × 1″ **12**/– each.
18″ × 1″ **13**/– each.

Fig. 1613.
Portable Folding Foot Pump.
15″ × ⅞″ **12**/– each.
18″ × ⅞″ **13**/– each.

Oil Syringes.

Fig. 1614.

		Size	Price	Size	Price
No. A	Bent nozzle	10″ × 1½″	**20/6**	9″ × 1¼″	**15/6**
No. B	Straight nozzle	10″ × 1½″	**20/6**	9″ × 1¼″	**15/6**

Fig. 1615. Grease Injector.
3½″ × 1¼″ .... Price **8/6** each.

Fig. 1616. Petrol Injector.
3″ × 1″ .... Price **4/4** each.

All the Air Pumps, Syringes and Injectors illustrated are of the best quality, manufactured from heavy gauge brass and machined parts. We do not stock cheaper grade.

These Blow Lamps are made of heavy gauge, non-porous brass, finely polished. Burners and flame tubes of special alloy.
Every Lamp is tested under a pressure not required in ordinary use.
British manufacture.

Fig. 1617.
For Brazing and Soldering. Burning Paraffin and fitted with Pump.

Capacity	1	2	pints
Weight	2¼	2¾	lbs.
Height	8½	8½	ins.
Price	**16**/–	**19**/–	each

Fig. 1618.
For Painters, Plumbers and Soldering Work.
Without Force Pump.

Capacity	....	⅔	pint
Weight	....	1¾	lbs.
Height	....	7	ins.
Price	....	**13/3**	each

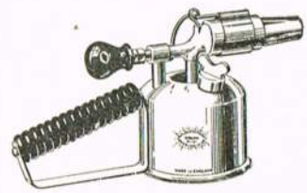


Fig. 1619.
For Painters, Plumbers and Soldering Work.
Horizontal Nozzle.

Capacity	....	⅔	pint
Weight	....	1¾	lbs.
Height	....	7	ins.
Price	....	**13/3**	each

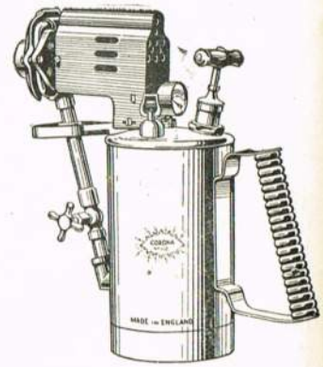
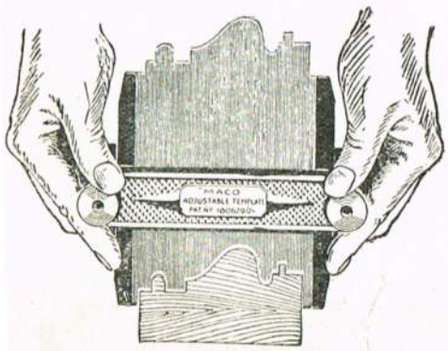


Fig. 1620.
For Brazing and Garage Work. Burning Paraffin. Fitted with Pump and Pressure Gauge.

Capacity	2½	5	pints
Weight	6	9½	lbs.
Height	12	15	ins.
Price	**57**/–	**67**/–	each



No. 3.

Fig. 1630.

The "Maco" Patent (Adjustable) Template.

This tool will secure the male and female shape of anything in a second. Consists of a number of hand-polished sheaths of a thickness .007″, the finest accuracy being obtained. Release the two thumbscrews, then press the template on to the article. Re-tighten thumbscrews and scribe off on to wood, paper or metal sheets. Machine cutters can be made from this with a fine degree of accuracy and saving of a great deal of time.

This tool is indispensable to Tool Makers, Engineers, Marble and Stone Masons, Decorators and Antique Designers.

Size inches	1¾	3	6	9	12	18	24
Steel Dents	**20**/–	**26**/–	**47/6**	—	—	—	—
Brass Dents	**26**/–	**37/6**	**60**/–	**126**/–	**273**/–	—	**600**/–

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STOVES.

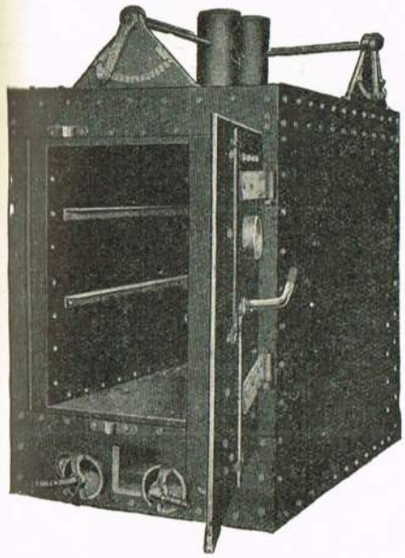

Fig. 1640/1 Improved Double and Treble Cased Enamelling, Japanning and Lacquering Stove Built in sections for easy handling and therefore can easily be erected. Both double and treble cased stoves are packed with 2-inch silicate cotton. Heated by town, Mond or Producer gas.

Body.—No gas fumes can come in contact with inside stove. The body is built up of strong Steel Channels ; Hydraulically Flattened Steel Sheets, 16G outside, 18G inside. The inner casing being arranged with a 2in. heating space at two sides and top, and an 8in. heating space at bottom. Provided with two of the latest pattern Ventilators and Regulators, the one connected to the inside of Stove and the other to the Heating Chamber. Four carrying handles provided and fitted inside Stove at each side.

The Front is provided with Double-Cased Doors, built up of strong Steel Channels and Hydraulically Flattened Steel Sheets, 12G outside, 16G inside. Packed with 2in. Silicate Cotton. Fitted with strong Wrought Iron Forged Hinges and latest pattern Lever Fastener.

Bottom provided with 8in. strip with openings for inspection and lighting.

Heated with latest type of atmospheric Bansen Burners (which consume a maximum amount of Air with a minimum amount of Gas), and perforated Wrought Iron Gas Pipes.

Stoves above 4ft.×3ft.×2ft. are fitted with circular type Thermometer, in strong Cast Iron Case, protected with glass front and calibrated to register up to 500° Fahr. Smaller Stoves have straight pattern Thermometer.

Vent Pipes, Trays or Carriers, etc., are not included, but are supplied if desired at extra prices.

Small Stoves are sent out assembled unless specially ordered otherwise. Will heat up to 500° Fahr. in a very short time and maintain uniform heat.

Fig. 1640. Dimensions and Prices of Standard Pattern **Double-Cased Stove,** specially designed for Enamelling, Japanning, etc.

Overall Dimensions—

Size	A	B	C	D	E	F	G	H	I	J	K
Height, feet	3	4	5	6	6	6	6	6	6	6	6
Width, feet	3	3	3	3	3	4	6	5	6	6	9
Depth, feet	3	2	3	2½	3	3	3	4	4	6	6
Weight, cwts. qr. lbs.	4 2 0	4 2 14	5 5 0	7 1 4	8 0 14	9 3 0	12 2 0	12 3 6	14 2 0	18 0 0	23 2 0
Price, each	**£10 10 0**	**£11 12 6**	**£13 0 0**	**£15 5 0**	**£16 15 0**	**£20 0 0**	**£24 0 0**	**£24 5 0**	**£26 10 0**	**£31 12 6**	**£39 0 0**

EXTRAS.—If packed 1¼in. instead of 2in. Silicate Cotton, deduct 10%. Sizes up to 4ft.×3ft.×3ft. fitted with Legs and Bottom Plate if required. Bottom Plate, **2/3** per foot super ; Legs, per set of 4 at **3/3** per foot high extra. Doors can be fitted with Mica Front Sight Hole at bottom. Extra Price for 4in.×2in. size, **5/6** each. Extra carrying Angles, **1/-** per toof depth of stove per pair. If Channel Trolley Rails required (see separate detail sheet), extra Price is **3/3** pre foot depth of stove per pair. Stoves 3ft. wide and under have one Single Door ; over 3ft. wide Double Doors ; over 6ft. wide Double Doors and side Panels to suit. Vent Pipe, Gas Pipe Covers, Floor Plates, extra.

Fig. 1641. Dimensions and Prices of **Treble-Cased Stoves,** specially designed for Cold Lacquering, Colour Work, etc.

Sizes A, B, C packed 1¼in. and 1¼in. Heating Chamber and sent out assembled. Sizes D, E, F, G, packed 2in. and 2in. Heating Chamber. If packed 1¼in. and Heating Chamber 1¼in., deduct 10%.

Size	A	B	C	D	E	F	G	H
Height, outside	2ft. 3in.	2ft. 9in.	3ft. 3in.	4ft. 0in.	5ft. 0in.	6ft. 0in.	6ft. 0in.	7ft. 0in.
Height, inside	1ft. 6in.	2ft. 0im.	2ft. 6in.	3ft. 0in.	4ft. 0in.	5ft. 0in.	5ft. 0in.	6ft. 0in.
Width, outside...	1ft. 11in.	2ft. 5on.	2ft. 5in.	2ft. 5in.	3ft. 0in.	4ft. 0in.	5ft. 0in.	6ft. 0in.
Width, inside	1ft. 6in.	2ft. 0in.	2ft. 0in.	2ft. 0in.	2ft. 4in.	3ft. 4in.	4ft. 4in.	5ft. 4in.
Depth, outside...	1ft. 8½in.	2fr. 2½in.	2ft. 2½in.	2ft. 0in.	3ft. 0in.	3ft. 0in.	4ft. 0in.	5ft. 0in.
Depth, inside	1ft. 6in.	2ft. 0in.	2ft. 0in.	1ft. 8in.	2ft. 8in.	2ft. 8in.	3ft. 8in.	4ft. 8in.
Weight, cwts. qrs. lbs. ...	2 2 21	3 3 14	4 0 21	5 3 0	10 1 4	12 1 0	15 2 0	23 2 0
Price, each	**£8 10 0**	**£10 14 0**	**£11 19 0**	**£17 5 0**	**£28 0 0**	**£32 0 0**	**£40 0 0**	**£55 4 0**

EXTRAS on A, B, C. 4 Legs, **2/9** per foot high. Bottom Plate, **2/3** per foot super. 4in.×2in. Sight Holes, **5/-** each. Additional carrying angles, **1/-** per foot depth of Stove per pair. Sliding doors over air and lighting holes in front strip, **5/6** each. Size A, B, C have single doors and catch and fitted with straight type Thermometer.

EXTRAS on D, E, F, G, H.—Bottom Plate, **2/3** per foot super. Legs per set of 4 at **3/3** per foot high. 4in.×2in. Mica Front Sight Holes, **5/6** each. Additional carrying Angles, **1/-** per foot depth of Stove per pair. Sliding Doors over Air and Lighting Holes in Front Strip, **6/3** each. Channels Trolley Rail, **3/3** per foot depth of stove per pair. Stoves 3ft. wide and under have one Single Door, over 3ft. wide Double Door, over 6ft. wide Double Doors and Side Panels to suit. Vent Pipe, Trays and Carriers, etc., extra.

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UNBREAKABLE LAMPS.

Fig. 1650. Engineers' Hand Lamps.

For kerosene, petroleum or paraffin.

No. 4. ½-pint .... **42**/– per doz.
No. 4A. ¾-pint .... **60**/– ,,
Extra wicks, No. 4 .... **1/3** per bundle
,, ,, No. 4A .... **2/6** ,,

Fig. 1651. Marine Boiler Space Lamps.

For use in marine boilers.

Size No. 7 only, ¾″ broad, **72**/– per doz.
Extra wick, **2/6** per bundle.

Fig. 1652. Moulders' Lamps.

Specially suitable for foundry use. Burns petroleum or paraffin.

48/– per dozen.

Extra wicks, **1/3** per bundle.

Fig. 1653. Kettle Torch Lamps.

For trench work, cable laying.

No. 18. 3 pints. 1¼″ wick.

14/– each.

Extra wicks, **2/6 per bundle.**

Fig. 1654. Large Trench Lamp.

No. 18A. 5 pint. Wick 2″.

24/– each.

Extra wicks, **3/6** per bundle.

Fig. 1655. Single Torch Lamps.

For colza or other heavy smokeless oils; also for kerosene.

No. 5. ½-pint, ⅝″ wick .... **60**/– doz.
No. 5A. ¾-pint, ⅝″ wick .... **72**/– ,,
No. 5B. 1 pint, 1¼″ wick .... **90**/– ,,

Extra wick, **2/6** per bundle.

Fig. 1656.

OIL GAS GENERATING LAMPS.

Clear, bright, smokeless light. For paraffin or petroleum.

No.		Each.
12.	Hanging lamp, capacity 3 hours	**25**/–
13.	,, ,, ,, 5 ,,	**30**/–
14.	,, ,, ,, 7 ,,	**35**/–

Nos. 13 and 14 arranged with two burners, **7**/– extra.

Nos. 12A, 13A and 14A, fitted with tripod stand, as shewn, **6**/– extra.

Extra burners, all sizes, **5**/– each.

Fig. 1657.

POWERFUL PORTABLE CONTRACTOR'S ACETYLENE FLARES.

No.	Candle power		Capacity hours	Price each
0	150	Vertical standpipe	6	**£3 10 0**
0A	150	Swivel arm ...	6	**£3 10 0**
2	1500	Single reflector ...	6	**£7 10 0**
3	3000	Double reflector ...	6	**£11 0 0**
4	3000	,, ,, ...	8	**£12 0 0**

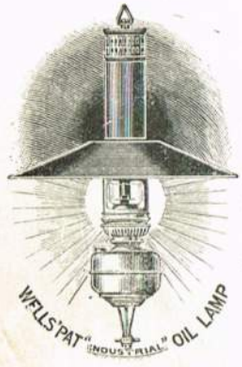

Fig. 1658.

"INDUSTRIAL" OIL LAMPS.

For offices, factories, warehouses.

A clear, steady light for petroleum or kerosene.

Central draught.

No. 1. 100-c.p. 8 hours. Brass container, capacity 2¾ pints. Price **50**/– each.

No. 2. 100-c.p. 12 hours. Steel container, capacity 5 pints. Price **55**/– each.

Extra wicks .... **6**/–doz.
Extra micas .... **2/6** ,,

Fig. 1659.

INCANDESCENT OIL LAMPS.

A cheap, brilliant and shadowless light, from petroleum or kerosene oil.

Suitable for inside or outside illumination.

No.			Price each
38	18″ high,	300-c.p. burner	**£5 10 0**
39	18″ high,	600-c.p. ,,	**£7 10 0**
40	18″ high,	1000-c.p. ,,	**£10 0 0**

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OIL CANS.

Fig. 1670. OBLONG STEEL SERRATED OIL CANS

with patent slide feed hole and seamless spout, with self-contained filter.

Capacity, pints	1/6	1/4	1/3	1/2	
Length of spout, inches ...	3½	3½	5	6	
With steel spouts, per doz. ...	**24/–**	**27/–**	**30/–**	**34/–**	
With copper spouts, per doz. ...	**25/–**	**28/–**	**32/–**	**66/–**	
Capacity, pints	¾	1	1½	2	4
Length of spout, inches ...	7	8	10	12	16
With steel spouts, per doz. ...	**40/–**	**48/–**	**56/–**	**68/–**	**126/–**
With copper spouts, per doz....	**42/–**	**50/–**	**59/–**	**71/–**	**130/–**

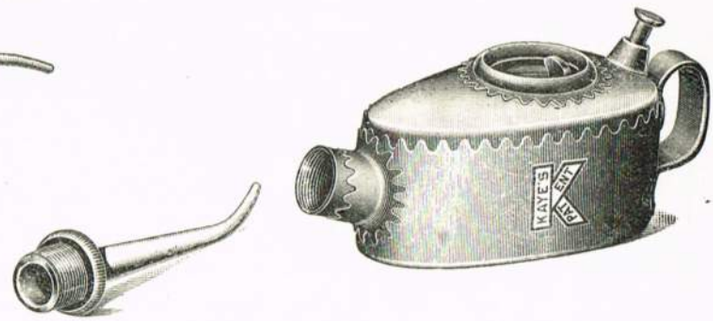

Fig. 1671. SERRATED SEAMLESS OIL CAN,

with interchangeable screwed spout.

Capacity, pints	1/3	½	¾	1	1½	2
Length of spouts, inches...	5	6	7	8	10	12
With steel spouts, per doz.	**36/–**	**40/–**	**46/–**	**54/–**	**62/–**	**78/–**
With copper spouts, doz.	**38/–**	**42/–**	**48/–**	**56/–**	**65/–**	**81/–**

Fig. 1672. No. 29. **Fig. 1673.** No. 30.

Fig. 1672/3. OIL CANS.

Number.	Capacity.	Steel.	PRICE PER DOZEN. Copperised Steel.	Copper.
29a	⅓ pint	**15/–**	**20/–**	**30/–**
29c	¾ ,,	**20/–**	**26/–**	**42/–**

Pattern Number.	Capacity.	Steel.	PRICE PER DOZEN. Copperised Steel.	Copper.
30a	¼ ,,	**15/–**	**18/–**	**30/–**
30b	½ ,,	**16/–**	**21/–**	**36/–**
30c	¾ ,,	**22/–**	**28/–**	**44/–**

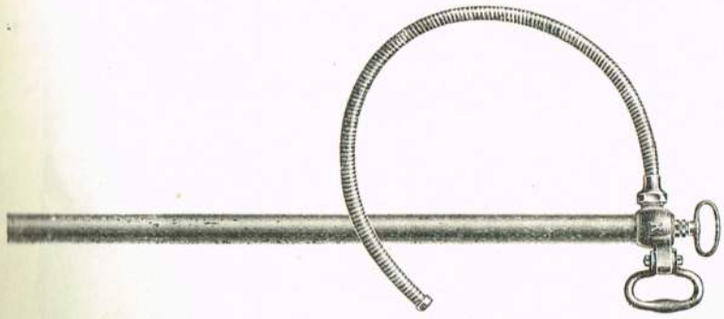

Fig. 1674. OIL PUMP for Light or Medium Oils.

Price ... **60/–** each.

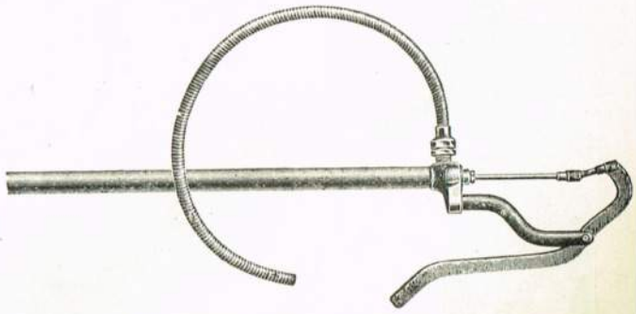

Fig. 1675. OIL PUMP for Heavy Oils or Vaseline.

Price ... **60/–** each.

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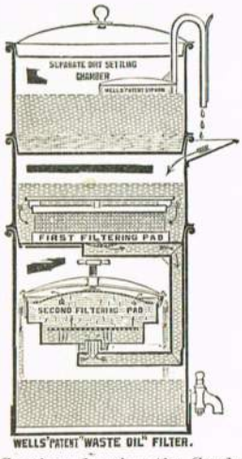
OIL FILTERS AND CABINETS.

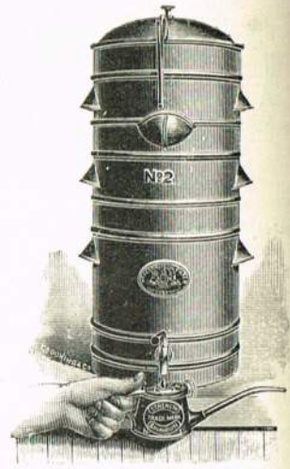


Section shewing the Syphon and Double Filtering Pads at work.

Fig. 1680. PATENT WASTE OIL FILTERS, with Sight-Feed Syphons on Nos. 2, 3, 4 and 5.

Simple construction, all parts being easily accessible for cleaning.

In estimating the quantity of oil each size of filter will settle and clean, it is impossible to be exact. So much depends on the thickness of oil, warmth of room, and amount of dirt and sediment in the oil. The figures given are for oils of ordinary thickness, and which will pass down by natural gravitation through the filtering pads. The speeds given above are based on the filters being kept at a temperature of about 70° F. They can, however, be much increased by raising the temperature.



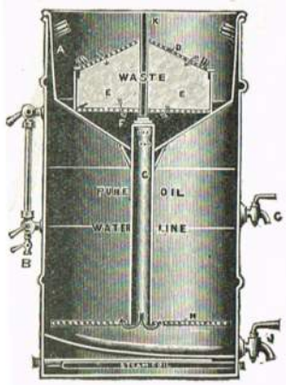
Size	1	2	3	4	5	6
Height, inches	17	22	27	36	43	60
Diameter, inches	9	10	12	16	23	30
Filter per week, gallons	2—3	8—10	12—15	20—25	45—55	400—450
Price each	**£2 10 0**	**£4 0 0**	**£5 10 0**	**£8 10 0**	**£13 10 0**	**£27 0 0**
Extra pads, per set	**1/3**	**2/6**	**4/6**	**7/–**	**10/6**	**10/6**

Sizes 2, 3, 4, and 5 can be fitted, at an extra cost, with steam coils, thereby more than doubling the speed of filtration.

Fig. 1680A. THE "VALOR RAPID" IMPROVED OIL FILTER.

Automatic in action. Cannot get out of order.

Description of section figures :—A, dirty oil receptacle ; B, water gauge tap ; C, filtered oil tap ; D, perforated lid ; E, cotton waste ; F, sediment tap ; G, pipe ; H, perforated disc ; J, water and sediment tap ; K, air tube.



DIRECTIONS TO START FILTER.

Remove lid and waste oil receptacle A, pour clean warm water into tank until it runs out of gauge tap B, then empty in pure oil until it rises to filtered oil tap C, fix steam connection to steam coil at bottom of filter, and turn on sufficient exhaust steam to keep the water warm, then replace waste oil receptacle A.

Empty waste oil into receiver A, until it rises above perforated lid, and cover D. The oil will then run through perforated lid and waste E, into compartment F, down pipe G, and on to underside and up through perforated disc H. The oil then rises and can be drawn off thoroughly filtered and ready for use at tap C.

Size No.	Approximate filtering capacity per day gallons	Height inches	Diameter inches	Price each
01	3 to 5	30	12	**£7 16 0**
02	15 to 20	34	18	**£10 16 0**
03	30 to 40	44½	24	**£21 12 0**
04	50 to 60	50	30	**£27 12 0**
05	70 to 90	52	33	**£33 12 0**

Carriage paid to any railway station in England and Wales.

Fig. 1681.

Fig. 1681/2. K's OIL ECONOMISERS.

Suitable for storing lubricating oils and for heavy gear oils. Made of heavy gauge tinned steel, enamelled, with brass pumps.

Capacity, gallons ...	1	2	4	6	10	12	15
Fig. 1681. Price each	**30/–**	**36/–**	**44/–**	**54/–**	**62/–**	**68/–**	**76/–**
Fig. 1682. Price each	**31/–**	**37/–**	**45/–**	**56/–**	**64/–**	**70/–**	**78/–**
Capacity, gallons ...	20	30	40	50	60	80	100
Fig. 1681. Price each	**84/–**	**96/–**	**110/–**	**126/–**	**140/–**	**170/–**	**200/–**
Fig. 1682. Price each	**88/–**	**100/–**	**114/–**	**130/–**	**146/–**	**176/–**	**210/–**

Price **5/6** extra for Paraffin or Petrol.

Fig. 1682.

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OIL CABINETS, Etc.

Open.

Fig. 1683. "VALOR" ENGINE OIL CABINETS. Best Quality.

Manufactured from tinned steel. Galvanised bottom, best finish, enamelled bright red. It shuts up and is therefore dust-proof, having a double lid, is entirely free from smell. Inside is furnished a perforated hinged lid, on which cans, etc., may stand when being filled and draining into the well of the cabinet. With polished brass pump, which is screwed into position and can be operated with one finger. Will fill 1 gallon measure in 12 seconds.

Cabinets lettered free of charge, as may be desired.

Capacity Stock sizes	Height (Top included)	Diameter	Price, including crate which is not returnable
50 gallons	3 feet 7¼ inches	2 feet 2½ inches	**£4 8 0** each
30 ,,	3 ,, 3½ ,,	1 ,, 9½ ,,	**£4 0 8** ,,
20 ,,	3 ,, 2¼ ,,	1 ,, 6¾ ,,	**£3 16 4** ,,
12 ,,	2 ,, 8¼ ,,	1 ,, 4½ ,,	**£3 11 0** ,,
6 ,,	2 ,, 0 ,,	1 ,, 2¼ ,,	**£3 8 0** ,,

Crates and delivery free to any railway station in the United Kingdom.

EXTRAS.

Union for screwing on nose of pump	**1/4** each
Patent flexible steel hose	**1/4** per ft.
Brass padlock	**2/6** each
Tapered union	**1/4** each

NOTE.

For pumping oil direct from barrels into the Cabinet, a union and 2 feet of hose for screwing on to nose of pump is usually supplied, if required, at **4**/– extra.

Fig. 1684. REMOVABLE BUNG POUR.

For emptying casks without pump, tap or stillage. For tar, oil, or any liquid. Will fit any ordinary cask from 20 to 60 gallons.

Price—in iron ... **31**/– each; in brass ... **50**/– each.

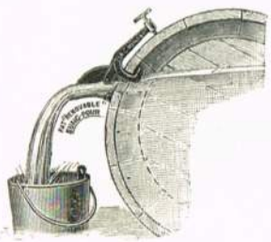

Fig. 1690.
K.'s OIL FILLERS.

Steel, non-seamless.

½ pint	...	**26**/– per doz.
1 pint	...	**36**/– ,,
2 pint	...	**28**/– ,,
3 pint	...	**32**/– ,,

Seamless steel.

1 pint	...	**32**/– per doz.
2 pint	...	**38**/– ,,
3 pint	...	**48**/– ,,

The above handles at back or side.

Copper, non-seamless.

1 pint	...	**4/6** each.
2 pint	...	**6**/– ,,
3 pint	...	**8/6** ,,

Fig. 1691.
CORRUGATED IRON OIL BOTTLE.

Extra strong and high.
Prices per dozen.

Pattern No.		Capacity		Price
42	...	1 pint	...	**34**/–
43	...	2 pints	...	**36**/–
44	...	½ gallon	...	**40**/–
45	...	1 ,,	...	**48**/–
46	...	1½ ,,	...	**56**/–
47	...	2 ,,	...	**64**/–
47a	...	3 ,,	...	**74**/–
47b	...	4 ,,	...	**94**/–
47c	...	5 ,,	...	**108**/–

Above fitted with steel lip, **6**/– extra per doz.
If fitted with steel lip and brass screw, **12**/– extra per dozen.

Fig. 1692. K's OIL FEEDERS.

Length—Inches	12	15	18	24	30	36	42
Steel—Per doz.	**48**/–	**51**/–	**54**/–	**60**/–	**66**/–	**74**/–	**86**/–
Copper—Each	**6/6**	**7**/–	**8**/–	**9/6**	**11**/–	**13/6**	**16**/–

With interchangeable steel screwed spouts, **6**/– doz. extra.
If made to pump, **2**/– each extra. If made leakproof, **1**/– each extra.
If made to pump and leakproof, **3**/– each extra.

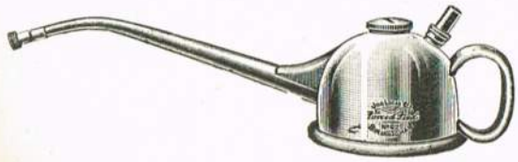

Fig. 1693.
LUCAS No. 62 ENGINEERS' FORCE FEED OIL CAN.

Strongly made of tinned steel.
½ pint, 13½" long overall ... **5/9** each.

Fig. 1694.
MOTOR CYCLE OIL CAN.

Seamless steel. Very strong.
Pressed tin plate, **18**/– doz. All brass, **30**/– doz.

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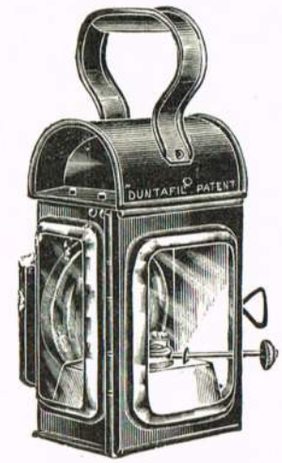
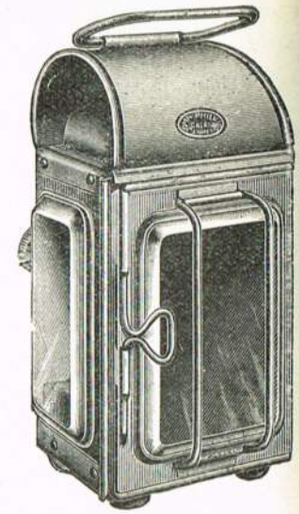
LAMPS.





Heavy Japanned Cart Lamps, best quality Burners, and will not blow out.

Fig. 1700.

Size inches.	Price each.
7 x 4	**4/6**
7¾ x 4½	**5/6**

Fig. 1701.

Size inches.	Price each.
7 x 4	**4/-**

With back or side hook.

Fig. 1702.

Size inches.	Price each.
7 x 4	**4/2**
7¾ x 4½	**5/3**
9 x 5	**12/-**

Extra for Wire Guards, **1/3** each.

Fig. 1703. Motor Tail Lamp.
With Glass both sides, Ruby front, fitted with Barton's burner. Size 8½″ x 4½″.
Japanned ... Price each **16/-**
,, with Spring back ,, **21/-**
Galvanized brass door & brass wire guards ,, **17/-**
,, with Spring back ,, **22/-**

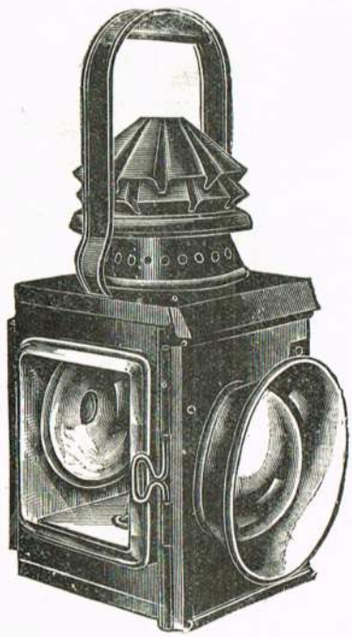
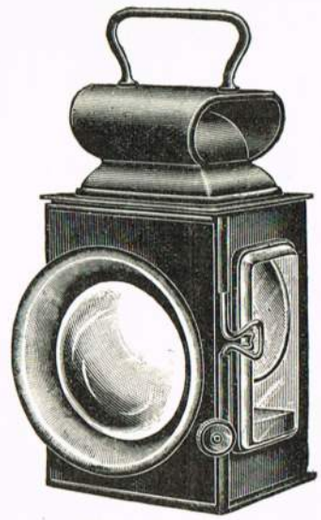


Fig. 1704. Traction Engine Lamps.

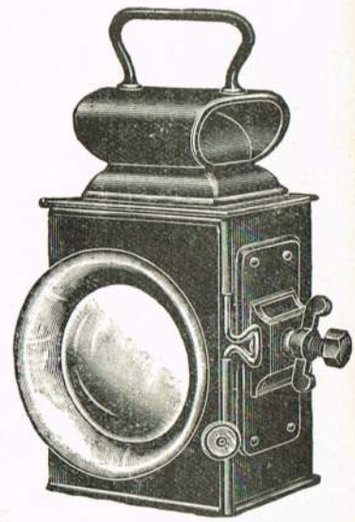
nest quality and fitted with Cut and lished Bull's Eye Lens. Plated Metal flectors and Bells, Japanned Black, and th 1″ Colza Oil Burner.

e inches. Body.	Size inches. Lens.	Price pair.
5½ x 4½	3½	**48/-**
7 x 4	4	**54/-**

fitted with Spring Attachment, **10/-** pair extra.



Nearside Lamp.



Offside Lamp.

Fig. 1705. Commercial Motor Lamps.

Constructed of extra heavy tin plated. Ebony Japanned, Malleable cast brackets, fly-nuts and screws. Solid front lens. Polished brass bell. Barton pattern burner with ratchet. Offside and nearside, Price **28/-** per pair. Rear (ruby lens), Price **14/-** each.

All Lamps supplied by us are best quality.

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LAMPS.

Fig.1706. Road Danger Lamp with Chimneyless Indestructible Burner. Burns 40 hours. Enamelled Red with White Bell.
2 White and 1 Ruby Lens. Price **17/6** ea.
2 Ruby and 1 White Lens. ,, **19**/– ea.
3 Ruby Lens. ,, **23**/– ea.

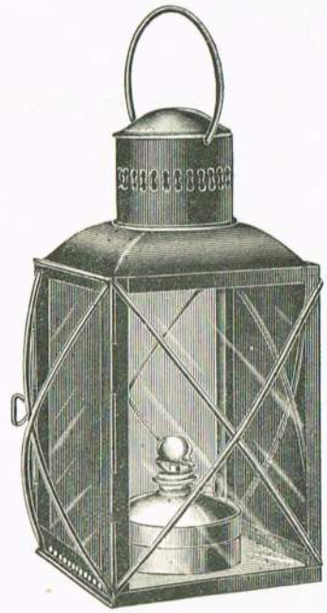

Fig. 1707. Contractors' Excavation Lamp

Enamelled all Red, with 2 Ruby and 2 White Glass, heavy burner and fitted with wire guards.

Price **6**/– each.

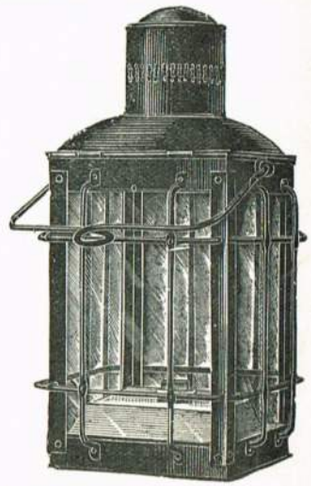

Fig.1708. Contractors' Lamp. Best quality Galvanized fitted with wire guards, 2 Ruby and 2 White Glasses, and 1″ Wedge Burner.

Price **12**/– each.

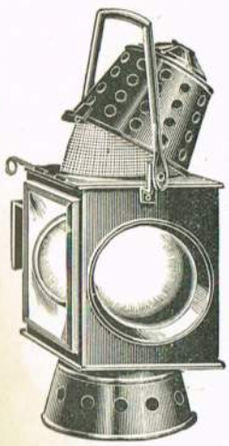

Fig. 1709. Safety Sewer Lamp

Armstrong's pattern, air ventilation, covered with Davy Gauze.

For Oil ... **42**/– each.
For Candle .. **42**/– each.

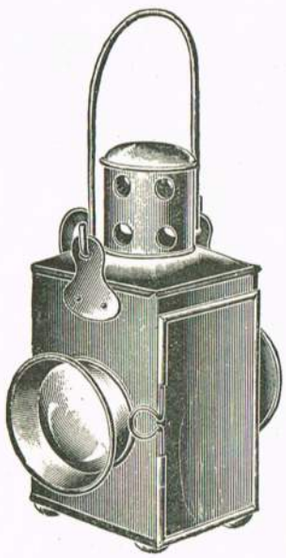

Fig. 1710. Flushers' Sewer Lamp.

As used by L.C.C., Etc. Body 7″ x 4½″ x 4½″. Burner 1″. Flat wick. Round container 3½″ x 2″ deep.

Price **26**/– each.

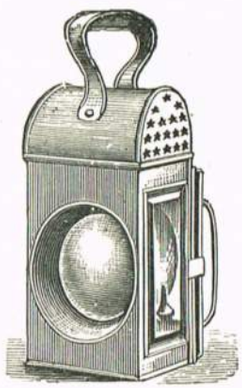

Fig. 1710a. Best Bright Tin Watchman's Lamp.

Plate glass sides. Front Bull's eye flush. Size 8¼″ x 4″ x 3¾″.

Price **17**/– each.

Fig. 1711. Hurricane Lamp.

Best Quality—
White Globe **78**/- per dozen.
Ruby Globe **20**/- doz. extra.

Cheaper Quality—
White Globe **68**/- per dozen.
Ruby Globe **20**/- doz. extra.

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LAMPS.

Fig. 1720. Railway Tricolour Signal Hand Lamp.

Japanned Black, Silver or Copper Covers and Reflectors.

4″ dia.	Glass front.	Price	**14**/– each.
4½″ ,,	,, ,,	,,	**15**/– ,,
5″ ,,	,, ,,	,,	**16**/– ,,

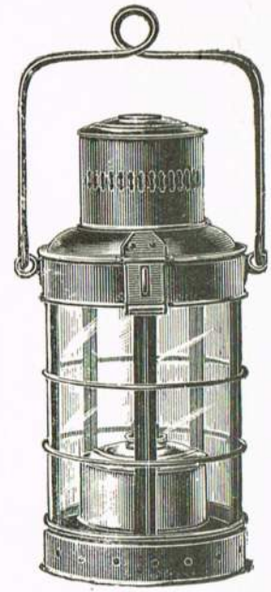

Fig. 1721. Heavy Quality Best Make Cargo Lamp.

Body 6″ dia.,	Japanned.	Price	**6**/–	each.
,, 6½″ ,,	,,	,,	**7/6**	,,
,, 6″ ,,	Galvan'd.	,,	**7/6**	,,
,, 6½″ ,,	,,	,,	**9/6**	,,

Fig. 1722. Ship's Tricolour Lamp, with

5″ x 3½″ Plain Lens and 3″ Coloured Lens

Copper, Price **82**/- each.

Galvanized, Price **70**/- each.

Ditto, for Colza Oil 4″ x 3″ Plain Lens and one 2½″ Ruby and Green Lens.

Brass or Copper, Price **60**/- each.

Galvanized, Price **48**/- each.

Fig. 1723. Starboard Launch and Yacht Lamp.

Size of Lens 5″ x 3½″ Plain.

Galvanized Price **62**/- pair.

Brass or Copper, Price **84**/- pair.

Size of Lens 5″ x 3½″ Dioptric

Galvanized, Price **84**/- pair.

Brass or Copper, Price **108**/- pair.

Fig. 1724. Port Launch or Yacht Lamp.

Size of Lens Ins.	Jap'd.	Galv'd.	Brass or Copper
4 x 3	**25**/-	**27**/-	**36**/-
5 x 3½	**29**/-	**33**/-	**44**/-
6 x 4	**31**/-	**35**/-	**48**/-

Price per pair.

Fig. 1725. Globe Lamp.

Size of Globe Ins.	Jap'd.	Galv'd.	Brass or Copper
5	**8**/-	**9**/-	**11**/-
6	**9/6**	**10/6**	**13**/-

Price each.

Fig. 1726. Mast head Lamp.

Size of Lens Ins.	Jap'd.	Galv'd.	Brass or Copper
4 x 3	**33**/-	**40**/-	**60**/-
5 x 3½	**36**/-	**44**/-	**64**/-
5½ x 4	**40**/-	**50**/-	**72**/-

Price per pair.

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HEATING AND LIGHTING PLANTS.

Fig. 1730. THE "WELLS LIGHT."

Adapted by the principal Railway Companies, Contractors, and Public Authorities.

No. 0. 500 Candles. Weight 30 lbs. Burns ordinary refined petroleum or kerosene, half-gallon per hour. Size of tank, 13½″ x 9″ diameter. Flame 12″ long.
Price complete **£7 7 0.** Extra burner **£1 10 0.**

No. 1. 1,500 Candles. Weight 40 lbs. Hand pattern, fitted with No. 2 size burner for Tar Oil. Flame 18″ long. Burns ¾-gallon per hour.

No. 1a. 500 Candles, fitted with No. 1 Burner (for abroad) for burning petroleum. Size of tank, 16″ x 10½″ diameter. Capacity, 4 hours burning, and can be replenished when alight. Price complete, No. 1 or No. 1a, **£10 0 0.** Extra burner, **£1 10 0.**

No. 3. 2,000 Candles. Fitted with Self-Starter. Manufactured from best Steel Boiler Plate. No smoke or smell. Weight, 150 lbs. empty, 280 lbs. full. Size of tank, 24″ x 18″ diameter, carried by two men. Flame 24″ long. 1¼ Gallons of oil per hour.
Price complete, **£16 10 0.** Extra burner, **£1 15 0.**

No. 3a. Fitted with No. 4 burner. 3,000 Candles. Price, **£16 15 0.**
Extra burners are always provided unless otherwise ordered.

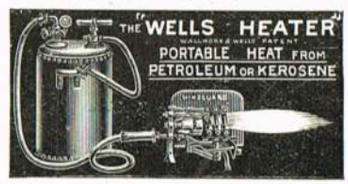

Fig. 1731. WELLS' PATENT PORTABLE HEATING PLANT.

These Plants can be re-charged without stoppage of work.

Powerful Plants for Heavy Work.

No. 2 Plant, consisting of very powerful burner, giving a flame about 3 feet long and 10 to 12 inches broad, of over **1,800 degrees Fahr.** open flame temperature, or over **2,150 degrees Fahr.** with flame enclosed by a few fire bricks; complete with strong steel oil tank, No. 3, 24″ x 18″. Working capacity 15 gallons. With fittings as illustrated, including 10′ special oil delivery hose. (**The Standard Heating Plant.**) Price **£26 5 0.**

Note.—The Tank supplied with No. 2 Plant can be arranged to work two burners with the addition of a two-way valve.

No. 1 Plant, comprises the same burner as that supplied with No. 1, but with galvanized oil tank, No. 1, 16″ x 10½″. Working capacity 4 gallons. Price **£18 5 0.**

Small Plants for Light Work.

No. 0 Plant, consisting of small cast burner, giving a flame about 2 feet long and 6 inches broad of over **1,600 degrees Fahr.** open temperature, or over **1,900 degrees Fahr.** with enclosed flame, with No. 1 oil tank (as No. 1 plant above), 16″ x 10½″. Working capacity 4 gallons; 8′ oil delivery hose and fittings. Price **£14 10 0.**

No. 00 Plant, comprising the same burner, but smaller oil tank, No. 0, 13″ x 9″. Working capacity 2 gallons. Hose and fittings as above. Price **£14 0 0.**

No. 000 Plant, comprising the same burner and hose, but small three gallon steel tank fitted with air pump, but no oil suction hose. Price **£9 10 0.**

Heating Burners only for Nos. 1 and 2 Plants, **100**/– each. Ditto. complete with 10 feet hose and couplings, **160**/– each.

Heating Burners only for Nos. 0, 00, and 000 Plants, **60**/- each. Ditto. complete with 8 feet hose and couplings, **90**/– each.

Extra hose, **3**/– per foot. Couplings, **6**/– per set.

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BRAZING LAMPS AND PAINT SPRAYERS.

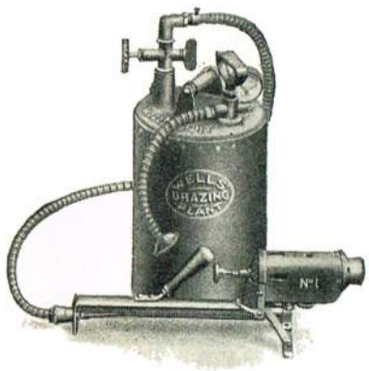

Fig. 1732. Wells' Paraffin Brazing Lamps.

No. 1. Plant with No. 1 Tank 16″ x 10½″, capacity 4 gallons. Burner and 8 feet Copper lined hose, 11¾″ flame, melts ¾″ Copper in 4 minutes. Consumes 3 pints per hour. Very suitable for garages and breakdown work. Price **£10 10 0.**

No. 2. Same as No. 1 but fitted with more powerful burner. Flame 19¾″. Melts 1″ Copper in 4 minutes. Consumes 10 pints per hour. Suitable for general engineering shops. Price **£12 0 0.**

Fig. 1733. Wells' Painting Machine.

Strong steel tank with movable screwdown cover, inside is a separate container n which is placed paint or other material. This moveable container is a special eature as other containers can be quickly substituted holding different colours. ir supplied from compressor at a pressure of approximately 25 lbs. per square ıch.

No. 1 size Tank, 16″ x 12″, capacity 4 gallons. Complete with pressure gauge, irrer, 40 feet of armoured air hose and 20 feet of paint hose with nozzles. Suitable r small general work. Weight, 82 lbs. Price **£25 0 0.**

No. 2 size Tank, 24″ x 15″, capacity 10 gallons. Same Specification as No. 1. omplete with hose and fittings. Suitable for boilers, ships, gas-holders and ofing. Weight, 90 lbs. Price **£30 0 0.**

Extras.

Set of nozzles with 20 feet each of armoured air and paint hose and connections to enable two operators to work from one No. 2 chine. Price **£8 18 0.**

Extra removable Paint Cans. Price **£0 15 0.**

Special nozzle for Ship-painting, Lime-washing, Tarring, etc., arranged on a 5-ft. pole. Price **£7 10 0.**

Paint Strainer or large Lime-wash Sieve. Price **£0 10 0.**

Fig. 1734. Special Hand Power Portable Air Paint Sprayer.

ıis Sprayer consists of a steel tank mounted on an iron frame, with wheels, and fitted with a patent hand pump. Price **£25**

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LIME AND COLOUR SPRAYERS.

Invaluable to Engineers, Decorators, Builders, Railways, Collieries, Factories, Breweries, Car Sheds, Bakehouses, Farms, Laundries, and Hospitals. Suitable for lime and water paints, creosote, solignum (No. 6 machine), but not for oil or varnish paints.

Can be applied at a speed of 10 to 20 square yards per minute and much superior to brushwork, especially on rough and inaccessible places.

These machines are specially designed to withstand **rough usage.** They are therefore made of the most durable materials, which, although adding to the initial cost, effect a great economy in their life and upkeep.

The **SPRAYING NOZZLE** is the nerve centre of a limewashing machine. Its construction, therefore, has been a first consideration, and, as will be seen from the illustration, it is a most important feature. The nozzle can be regulated to any degree of fineness by means of the spray regulator, while the patent filter prevents clogging. The whole can be cleaned easily, and replaced quickly. An additional and essential feature is the ability to **swivel** the nozzle to any angle, thus greatly assisting the operator and enabling a right-angled spray to be brought to bear on any surface.

The **PUMP** is simple and easily removable for repairs, while the **BELL-HANDLE** and **TRIGGER VALVE** provide a comfortable grip, and an immediate control over the spray by the mere pressure of the hand.

Attention is called to the **AIR CHAMBER,** which is constructed of sufficient size to enable an even spray to be maintained without continual pumping.

Large-capacity Tanks or Pails are not recommended. With smaller tanks the settlement of the lime is reduced, and the machine rendered more portable. Fresh supplies of liquid can be quickly added as required.

Fig. 1735. Double Spraying Machines.

No. 5a.—A powerful machine, with 12-gallon tank and strong lever pump. Every part best materials, and suitable for anyone having a large quantity of work to do quickly. Supplied with large wheels easily moved about, 20 feet of Armoured Delivery Hose, Gauge, Double Spraying Nozzle, 5-foot Pole, and Sieve. Price **£12 5 0.**

No. 5b.—An equally powerful machine, having the same strong Lever Pump, Double Spraying Nozzle, 5-foot Pole, 15 feet of Armoured Delivery Hose, Gauge, and Sieve. The pump being independent of the tank facilitates cleaning purposes, whilst the 6-gallon removable pail can be quickly replenished or a fresh pail substituted. Extra pails can be supplied as desired. Many prefer this arrangement. Price **£10 15 0.**

SPECIAL BAMBOO POLES, 8 feet long, are supplied if desired for all machines. These are fitted with connections for the nozzle and trigger valve of the machine to be transferred to.

Fig. 1736. Single Spraying Machines.

No. 4.—A useful pattern having two handles, making it easily carried to the work. The tank is of strong galvanized iron, and holds 8 gallons. Complete with Gauge, 15 feet of Armoured Delivery Hose, 5-foot Spraying Pole, single Spraying Nozzle and Sieve. Price **£8 15 0.**

No. 4a.—The same machine as above but fitted with drop handle and strong wheels, which add to the portability, and are a great convenience. Price **£9 15 0.**

No. 8.—This light, cheap, and portable pattern is specially designed for small work, and is particularly adapted for farm use in connection with stables, pens and similar undertakings. Consists of strong 6-gallon Galvanized Iron Bucket with Drop Handles and Iron Foot Rests; first-class strongly made double-acting Brass Pump ensuring powerful and continuous spray. 8 Feet of Best Ribbed Rubber Hose, High Grade Nozzle and Removable Sieve. Price **£3 12 0.**

No. 6.—A handy and compact machine with cast iron folding base, supplied with 6-gallon removable Pail, and Single Spraying Nozzle, and Trigger Valve as for Nos. 4 and 4a machines. Fitted with 5-foot Pole and 10 feet of Special Armoured Hose Gauge extra if required. Price **£7 15 0.**

No. 6a.—Specially designed to meet the demand for a cheap and efficient machine. Fitted with strong wooden base and a detachable tank of 6 gallons capacity, 8 feet of Armoured Delivery Hose, modified Single Spraying Nozzle, 5-foot Pole and Sieve, Gauge extra if required. Price **£6 0 0.**

No. 7.—Cheap pattern to be used with Customers' own pail. Same machine as No. 6a, but with reduced pole and tap in place of trigger valve. Farmers and others will find this a strong and low-priced machine. Price **£4 17 6.**

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TAR SPRAYIG APPARATUS.

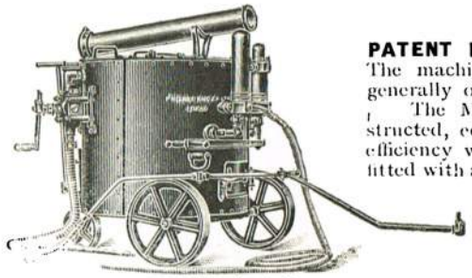

Fig. 1740. Vertical Pattern.

PATENT RAPID HAND TAR-SPRAYING MACHINE. The machines are of simple design, well constructed generally on the same lines as Tar Boilers listed.

The Machines are simple in design, soundly constructed, economical in working, and give a maximum of efficiency with a minimum of attention. The Boiler is fitted with a draw-off cock, so that, without the removal of any fittings, it may be used as an ordinary tar boiler. Provided that ordinary care is used, the machine is practically continuous in action. Without extra charge we can fit an arrangement for pumping hot air through the spraying apparatus for cleaning purposes, if ordered with the Machine. Each machine is sent out complete with Valve Inspection Key, Hose Union Key, and Firing Tools, consisting of Poker, Rake and Paddle Stirrer.

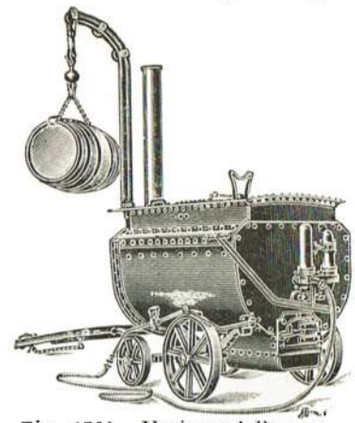

Fig. 1741. Horizontal Pattern.

The pan is fitted with a strainer fixed across the centre, which screens the tar and also serves as a division plate, ensuring a continuous supply of hot tar to the pump. In the Horizontal pattern Machines the pan is also fitted with a washplate to prevent the slopping of tar, and also to act as a barrel rest when the boiler is being charged. The shafts can be fitted at a slight extra charge with quick release gear, by means of which one man can release and control the horse in case of fire.

Means of Filling.—The Machines are fitted either with a Jib Crane, Cast-iron Filling Pump or Inclined Hoist, at customer's option.

The Jib Crane is made of wrought-iron tube, reinforced externally with wrought-iron bars. The lifting is done by means of a winch, fitted with an arrangement to prevent overwinding, and is attached to the Machine. It has quick motion and will raise a barrel with half the effort and in half the time required when pulley blocks are used. We recommend the Appliance for all Machines of 160-gallon capacity and over.

The Filling Pump is of cast-iron throughout. The valves are steel balls, easily accessible. There are only three working parts, so that there is little likelihood of the Pump getting out of order. It may be used with a rotary or semi-rotary motion. The Pump is suitable for any size Machine.

The Inclined Barrel Hoist consists of two skids braced together, a wrought-iron cradle, on which the barrel is placed, and a winding drum, by means of which the barrel is raised into position for emptying. The Hoist will be found to meet a long felt want for a suitable apparatus for raising barrels on to Machines not large enough to carry a Jib Crane, and will be found most suitable for the 80-gallon Horizontal and all Vertical Boilers.

Spraying Pump.—The Spraying Pump is constructed entirely of cast iron, and is designed especially for dealing with hot tar. The valves are steel and are easily accessible without dismantling any part of the Pump. The plunger is of cast iron, and there is no packing of any sort. The design of the Pump is such that the rod is always in suction, thus entirely obviating that troublesome leakage which has up to the present been a feature of hot tar Pumps. The air vessel is extra large, cast in one piece. There being no joints on the top, there is no risk of leakage of air, which, it if occurs, has the effect of reducing the pressure and efficiency of the Pump. The Pump is easily operated by one man, the lever providing a simple up and down motion. The operator stands on the near side if the boiler, well away from the fire.

Hose.—Each Machine is supplied with a 20ft. length of Hose, specially constructed for conveying hot tar. The Hose consists of an internal metallic lining encased in asbestos, with a canvas and rubber covering, the whole being armoured externally. The Hose is fitted each end with our Patent Unions.

Scythe Spraying Pipe.—The Scythe Spraying Pipe is so designed as to throw the least possible weight upon the operator, and is provided with two handles, one of which is fitted to a tap, which enables the operator to maintain perfect control without releasing the handles. If desired, the Machine can be fitted with more than one Spraying Pipe, or with more than one nozzle to the one Spraying Pipe, the Pump being of ample capacity for dealing with this arrangement.

Spraying Nozzle.—At the end of each Scythe Spraying Pipe is screwed a nozzle of unique design, made especially for easy cleaning, being fitted with a small clip-on cap for this purpose.

PRICES OF VERTICAL PATTERN. **Fig. 1740.**

Capacity. Galls.	Approx. Overall Dimensions, exclusive of Fittings. Height. ft. in.	Outside Diameter of Casing. ft. in.	Approx. Weight. cwt.	Price. £ s. d.	Hose and Unions. Per 20 ft.	Spares. Nozzles. Each.	Fire Gratings. Each.
50	3 7	3 0	7	**55 10 0**	**100/–**	**30/–**	**15/–**
80	3 11	3 5	10	**63 15 0**	**100/–**	**30/–**	**30/–**
100	4 2	3 10	13	**79 10 0**	**100/–**	**30/–**	**30/–**
150	4 10	4 4	16	**90 10 0**	**100/–**	**30/–**	**45/–**

Machines are sent out fully equipped with our new pattern Spraying Pump, 20 feet specially prepared Armoured Hose with patent Couplings, Scythe Pipe and patent Nozzle, Filling Pump or Inclined Barrel Hoist, Hose and Pump Spanners, Draw-off Cock, Firing Tools, with Drag Handle in the case of the two smaller sizes and Horse Shafts with the two larger sizes.

PRICES OF HORIZONTAL PATTERN. **Fig. 1741.**

Capacity. Galls.	Approximate Overall Dimensions, exclusive of Fittings. Length. ft. in.	Width. ft. in.	Height. ft. in.	Approx. Weight. cwt.	Price. £	Hose and Unions. Per 20 ft.	Spares. Nozzles. Each.	Fire Bars. Per set.	Furnace Bricks. Per set.
80	3 10	3 2	3 11	11	**85**	**100/–**	**30/–**	**20/–**	**45/–**
160	5 0	3 11	4 10	23½	**105**	**100/–**	**30/–**	**30/–**	**55/–**
250	6 2	4 1	5 4	30½	**132**	**100/–**	**30/–**	**40/–**	**55/–**
320	6 5	4 11	5 6	37½	**150**	**100/–**	**30/–**	**40/–**	**65/–**

Machines are sent out fully equipped with our new pattern Spraying Pump, 20 feet specially prepared Armoured Hose with patent Couplings, Scythe Pipe and patent Nozzle, Jib Crane or Filling Pump, Hose and Pump Spanners, Draw-off Cock, Firing Tools and Horse Shafts. The 80-gallon size is provided with Inclined Barrel.

Quick Release Gear can be fitted to Horse Shafts at an extra charge of **£2 2s.** Thermometers can also be fitted at extra charge if required.

Hot air Scavenging Gear can be fitted without extra charge if ordered with the Machine. This fitment is recommended where bituminous mixtures are to be sprayed.

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TAR BOILERS, Etc.

Fig. 1742.

HORIZONTAL PATTERN PATENT TAR AND PITCH BOILERS. These boilers are specially constructed of heavy mild steel plates with cover, half of which is bolted to the pan, the other half being fitted with strong hinges to withstand rough use. The outlet pipe is so arranged to enable the pan to be completely emptied. The pan is a separate unit fixed by bolts. Hence it can easily be removed if required. **Casing** is built up of rolled steel plates and rivetted on to a steel framework, lined throughout with heat resisting material. **Fire Box** constructed of steel plates bent to form an ash pan, fitted with Lancashire boiler pattern fire bars of ample dimensions; hinged steel door carried on a steel frame. Fire box is lined with best fire clay bricks and arches; thus the pan is completely guarded against excessive fire-box heat. The flues are of large size, fitted with baffle plates, thus tending to increase and make more uniform the heating of the fire-box and causing the gases to be properly broken up. An extra large soot door is provided in the end casing. Chimney is also well constructed, with strengthening rings at the top and shrunk in at the foot into a cast-iron frame. Provided also with a cast-iron damper it is hinged to a bend securely fastened to the casing, and provided with a cast steel spring and snap. The outlet pan is supplied with cast-iron full-bore draw-off cocks or a special cast-iron so-called treacle or thick fluid valve. Under-carriage as shown is of heavy design, well sprung with laminated steel springs, cast-iron swivel bogey and coil spring. Detachable selected ash shafts are fitted with the necessary hooks and chain. Body is painted red oxide, under-carriage black. The boilers have been tested and found to be more economical in every respect over the old-fashioned type.

NOTE.—The 80 gallon Boiler is fitted with man-power drag handle, but can be fitted with horse shafts at slight extra cost. Quick release gear can be fitted to horse shafts for **£2 2s.** extra.

Capacity. Galls.	Approx. Overall Dimensions exclusive of Fittings. Length. ft. in.	Width. ft. in.	Height. ft. in.	Approx. Weight. cwts.	Price on Four Wheels. £	Price on Pedestals. £	Jib. Crane.	Extras. Poker, Rake and Paddle Stirrer.	Spares. Fire Bars Per set.	Furnace Bricks Per set.
80	3 10	3 2	3 11	9	**44**	**39**	**340/–**	**14/–**	**25/–**	**50/–**
160	5 0	3 11	4 10	20	**66**	**59**	**340/–**	**22/–**	**40/–**	**60/–**
250	6 2	4 1	5 4	27	**92**	**83**	**340/–**	**32/–**	**50/–**	**60/–**
320	6 5	4 11	5 6	34	**110**	**100**	**340/–**	**32/–**	**50/–**	**75/–**

Fig. 1743.

Patent Vertical Tar and Pitch Boilers. Made practically on the same specification of the above with certain exceptions owing to the different design. Illustration represents the 10 to 100 gallon sizes.

Capacity. Galls.	Overall Dimensions exclusive of Fittings. Height. ft. in.	Outside Diam. of Casing. ft. in.	Approx. Weight. cwt.	Price on Wheels. £	Price without Wheels. £ s.	Extras. Tar Gas Burners.	Valves or Outlets.	Poker, Rake and Paddle Stirrer.	Spare Fire Grate.
10	2 7	1 10	1½	**10**	**9 0**	—	—	**10/–**	**7/6**
25	3 1	2 5	3	**16**	**14 10**	—	**42/–**	**10/–**	**15/–**
35	3 4	2 7	4	**18**	**16 10**	—	**42/–**	**14/–**	**15/–**
50	3 7	3 0	5	**20**	**18 0**	—	**42/–**	**14/–**	**15/–**
80	3 11	3 5	8	**24**	**22 0**	**42/–**	**42/–**	**14/–**	**30/–**
100	4 2	3 10	11	**30**	**28 0**	**50/–**	**42/–**	**22/–**	**30/–**
150	4 10	4 4	14	**40**	**36 0**	**80/–**	**60/–**	**22/–**	**45/–**

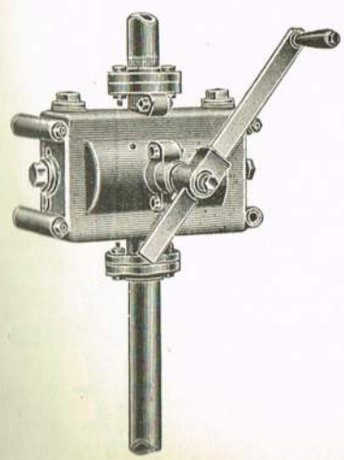

Fig. 1744.

Rapid Filling Tar Pumps for filling Road Tarring Machines and Tank Vans. Specially designed for this particular work to give maximum flow in minimum time. Bodies are heavy grey castings well machined. Securely bolted together. The steel ball valves are very accessible. Constructed with few working parts, this pump will not readily get out of order.

Price with 5in. Working Barrel for 1½in. Inlet and Outlet, **£15.**
Price with 4in. Working Barrel for 1¼in. Inlet and Outlet, **£12.**

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PUMPS.

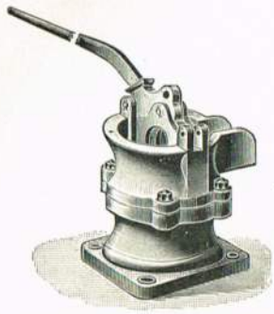

Fig. 1760/1. Diaphragm Pump. Illustration of Pump fitted with Straight Suction from below, screwed for iron tube.

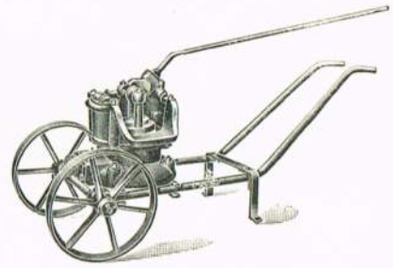

Fig. 1760A. Illustration of **Fig. 1760** mounted upon strong wrought iron steel barrow with a pair of wheels.

Fig. 1765. Diaphragm Lift and Force Pump, same design as **Fig. 1760,** but fitted with enclosed head to force liquids. Reversible handle and spout. Fully equipped for immediate use, made of finest material, and used by contractors and municipal authorities. Most suitable for sewage, road and trench work. For dirty or clean liquids.

Size, inches	2	2½	3	4
Fig. 1760. With Straight Suction for iron tube ...	—	£4 2 6	£4 10 0	£6 15 0
Fig. 1761. But with Side Suction for iron tube ...	—	£4 10 0	£5 0 0	£7 10 0
Fig. 1765. With Side Suction for iron tube	£3 15 0	£4 10 0	£8 0 0	—
Fig. 1760A. Wheel barrow only	£3 0 0	£3 0 0	£3 0 0	£3 0 0
Fig. 1765A. Brass Half Union for India-rubber Suction Hose	6/6	8/6	13/6	18/–
Fig. 1765B. India-rubber Suction Hose, per foot ...	2/6	3/6	4/–	6/–
Fig. 1765C. Galvanized Steel Strainers, each	5/6	6/6	7/6	10/6
Fig. 1765D. Brass Double Unions	10/6	12/6	20/–	30/–
Fig. 1765E. Cast-iron Foot Valves and Strainers ...	9/6	10/–	15/–	22/6
Fig. 1765F. Hose Pipe Clips, each	2/–	2/–	2/6	3/–
Fig. 1765G. Spare India-rubber Diaphragms	—	8/6	10/6	14/6

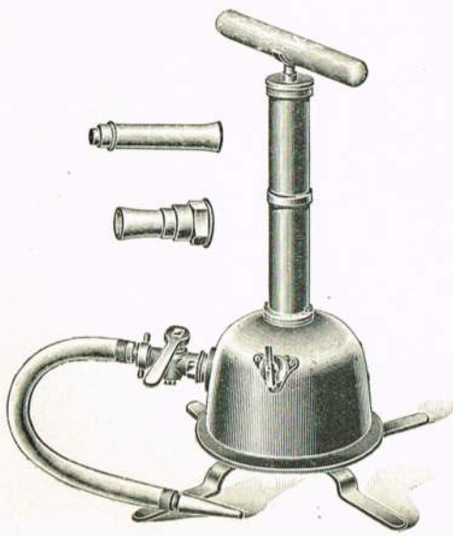

Fig. 1770. Strong Gas Service Pumps. For cleaning gas mains and pipes, including 2 feet of india-rubber hose, with connections to fit ⅜ inch to 1¼ inch iron pipes.
Price, **70/–** each.

Fig. 1771. Post Hole Diggers. Specially suitable for boring holes for scaffold, tramway and telegraph poles, fencing posts, etc. Quick in action. Fitted with handle bars, 48 inches long.

Diam., ins.	3	4	5	6	8	10	12
Price each	**10/6**	**12/9**	**17/3**	**21/-**	**24/–**	**37/6**	**45/–**

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PUMPS.

Fig. 1772. Cast Iron Pitcher Spout Pump or Driven Tube Well Pump. These pumps are largely used for Driven Tube Wells. Prices for well tubing and points upon application.

Diameter of barrel, inches	2½	3	3½	4	5
Diameter of Well Tube or Suction, inches	1	1¼	1½	2	3
Price, each	**10/–**	**12/–**	**13/–**	**14/–**	**36/–**

Short Type Cast Iron House or Colonial Pumps. A very popular type of pump at home and abroad. The handles are reversible. These pumps are anti-freezing, as by raising the handle to its full height the barrel is emptied of water. The suction pipes are screwed for iron pipe or tinned for lead.

Diameter of barrel, inches	2	2½	3	3½	4
Diameter of Suction, inches	1	1¼	1½	2	2
Quantity of water delivered in gallons per hour at 30 strokes per second	100	150	270	400	500
Fig. 1773. Pump as shown, with flanged base, each	**8/6**	**10/6**	**13/–**	**19/–**	**24/–**
Fig. 1773A. Pump as shown, but with ears fitted to back for fitting to upright, each	**8/6**	**10/6**	**13/–**	**19/–**	**24/–**
Fig. 1773B. Pump as shown, but fitted with tripod	—	**19/–**	**22/6**	**30/6**	**40/–**
Extra for Brass Bucket and Valve	**3/–**	**3/9**	**4/9**	**5/9**	**7/6**
Extra for Copper Lining	**2/6**	**3/6**	**4/9**	**5/9**	**6/9**
India-rubber Suction Hose for **Fig. 1773**, with tripod, per foot ...	**1/6**	**1/9**	**2/–**	**2/7**	**2/6**
Galvanised Strainers for ditto, each	**2/3**	**2/6**	**2/9**	**3/–**	**3/–**
Galvanized Suction Pipe, per foot	**–/9**	**1/–**	**1/2**	**1/6**	**1/6**
Galvanized Beds, each	**1/2**	**2/–**	**2/6**	**4/–**	**4/–**

Strong Brass or Iron Lift and Force Pumps, mounted on long oak planks.

Diameter of barrel, inches	2	2½	3	3½	4	4½
Diameter of Suction and Delivery Pipe, inches	1	1¼	1½	2	2	2½
Approximate quantity of water raised in gallons per hour at 30 strokes per minute	170	270	380	520	690	870
Fig. 1774. Price each, Iron Pump with copper lining and brass Unions	**45/–**	**53/–**	**60/–**	**72/–**	**80/–**	—
Fig. 1774A. Price each, Strong Brass Pump	**60/–**	**75/–**	**85/–**	**105/–**	**125/–**	**170/–**
Fig. 1774B. Price each, heavy Brass Pump	**84/–**	**105/–**	**126/–**	**147/–**	**168/–**	**210/–**

The suction and delivery of Brass Pumps are arranged for lead pipes unless ordered for iron. All Pumps have Brass Unions fitted screwed for iron pipes, but lead pipes can be attached.

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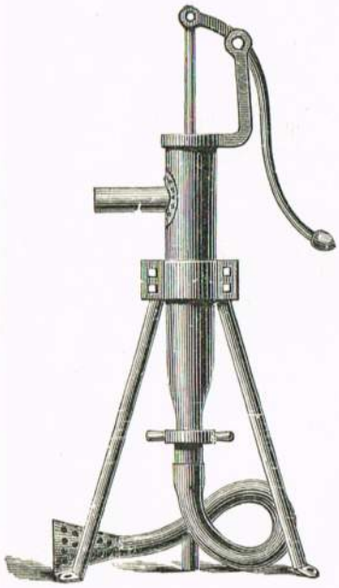
PUMPS.



STRONG GALVANIZED STEEL LIQUID MANURE OR CONTRACTORS' PUMPS. On Tripod Stands or fitted with clips to bolt to wall or upright.

Diameter of barrel, inches ...	3	4	4½	5	6
Diameter of Suction, inches	1½	2	2	2½	3
Fig. 1775. On Tripod Stand, arranged for I.R. Hose, as illustrated, each...	**42/–**	**45/–**	**48/–**	**55/–**	**80/–**
Fig. 1775A. As above, fitted for iron suction, each ...	**40/–**	**42/6**	**45/6**	**51/6**	**75/–**
Fig. 1775B. As above, without tripod, fitted with clips for bolting to wall and for I.R. hose, each...	**38/6**	**41/6**	**44/6**	**51/6**	**75/–**
Fig. 1775C. As above, without tripod, arranged for iron suction ...	**36/6**	**39/–**	**42/–**	**47/–**	**70/–**
India-rubber Suction Hose, per foot ...	**2/–**	**2/6**	**2/6**	**3/6**	**4/6**
Galvanized wrought-iron Suction Pipe, per foot ...	**1/2**	**1/6**	**1/6**	**2/6**	**3/–**
Galvanized Strainers, each ...	**2/9**	**3/–**	**3/–**	**3/6**	**5/–**
Galvanized W.I. Bends, each ...	**2/6**	**4/–**	**4/–**	**10/–**	**14/–**
Extra Brass Hose Unions, per pair ...	**5/6**	**8/6**	**8/6**	**10/6**	**16/6**

STRONG GALVANIZED STEEL LIQUID MANURE OR CONTRACTORS' LIFT AND FORCE PUMPS.

On Tripod Stands or with clips for bolting to wall or upright.

Diameter of barrel, inches ...	3	4	4½	5	6
Diameter of Suction, inches	1½	2	2	2½	3
Fig. 1776. On Tripod Stand with Unions for I.R. Hose, each	**72/–**	**75/–**	**88/–**	**100/–**	**140/**
Fig. 1776A. As above, but fitted with clips for bolting to wall ...	**68/6**	**71/6**	**76/6**	**96/6**	**135/–**
India-rubber Delivery and Suction Hose, per foot...	**2/–**	**2/6**	**2/6**	**3/6**	**4/6**
Canvas Delivery Hose, per foot ...	**–/6**	**–/8**	**–/8**	**–/10**	**1/–**
Galvanized W.I. Suction Pipe, per foot ...	**1/2**	**1/6**	**1/6**	**2/6**	**3/–**
Galvanized W.I. Bends each ...	**2/6**	**4/–**	**4/–**	**10/–**	**14/–**
Galvanized W.I. Strainers ...	**2/9**	**3/–**	**3/–**	**3/6**	**5/–**
Extra Brass Hose Unions, price per pair ...	**5/6**	**8/6**	**8/6**	**10/6**	**16/6**
If above Pumps arranged for Iron Suction, less each ...	**2/–**	**2/6**	**2/6**	**3/6**	**5/–**
If above pumps arranged for Iron Suction and delivery, less each ...	**4/–**	**5/–**	**5/–**	**7/–**	**10/–**

Fig. 1777. Best Quality Double Acting Semi-Rotary Wing Pumps, with Iron Body and Counter Flanges, Brass Valves.

No.	Size of Suction and Delivery Connections. inches.	Approximate Weight. lbs.	Approximate Capacity per hour. Galls.	Speed per minute, double strokes.	PRICES each.
0	½	11	240	104	**36/–**
1	¾	14	360	100	**40/–**
2	1	19	510	88	**48/–**
3	1¼	26	660	82	**58/–**
4	1¼	34	840	80	**72/–**
5	1½	42	1170	72	**80/–**
6	1½	57	1440	58	**96/–**
7	2	64	1830	56	**124/–**

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PUMPS.

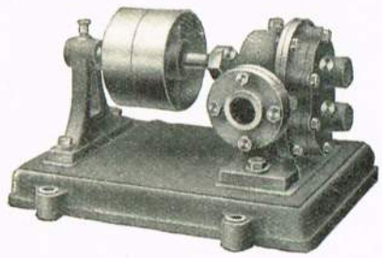

Fig. 1780. Standard Model.

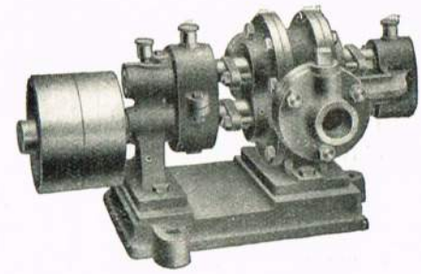

Fig. 1781. New Model.

The above are fitted with Internal Gear Box and all gears used are machine cut from the solid. The Casings and rotars are made of high-grade grey cast iron, accurately machined and fitted. The mild steel Spindle is of heavy size and runs in long bearings. The Vanes are constructed of gun metal. All parts are interchangeable.

This new model is constructed of the same material as the standard model but the spindles are run in stuffing boxes and glands and are therefore made to run without any leakage whatever. All the gearing is outside and is made to run in oil in an oil-tight casing. The bearings are fitted with syphon feed lubricators and no oil or grease can come into contact with the liquid being pumped.

Prices and Particulars of "STANDARD" Turbo Rotar Pump.

Fitted with Fast and Loose Pulleys for Heads up to 50 feet.

No. of Pump	Dia. of Pipes ins.	Approx. Revs.	Dia.&Width of Pulleys ins.	Approx. Galls. per hour.	Prices. Iron Pump.	Prices. Gun Metal.	Horse Power Required for Various Heads. 10 feet	20 feet	30 feet	40 feet	50 feet
3	¾	550	4 x 1½	500	**£15 10 0**		¼	¼	½	½	½
4	1	500	5 x 1¾	850	**£20 0 0**		¼	½	¾	¾	¾
5	1¼	400	6 x 2	1,200	**£30 0 0**	On	¼	½	¾	1	1
6	1½	350	7 x 2¼	2,200	**£40 0 0**	application	½	¾	1	1½	1½
7	2	350	10 x 2¼	3,000	**£50 0 0**		¾	1	1¼	1½	1½
8	2½	300	12 x 3	5,000	**£65 0 0**		1	1½	2	2½	3½

Prices and Particulars of "NEW MODEL" Turbo Rotar Pump.

Fitted with Fast and Loose Pulleys for Heads 50 to 100 feet.

Size	Dia. of Pipes. ins.	Revs. per Min.	Size of Pulleys. ins.	Gallons per hour.	Prices. Iron Pump.	Prices. Gun Metal.	Horse Power Required for Various Heads. 40 ft.	50 ft.	60 ft.	70 ft.	80 ft.	90 ft.	100 ft.
O	¾	550	5 x 2	500	**£44 0 0**		½	½	¾	¾	¾	1	1
A	1	500	6 x 2¼	850	**£46 0 0**		¾	¾	1	1	1	1¼	1¼
B	1¼	400	7 x 2½	1,200	**£48 0 0**		1	1	1¼	1¼	1¼	1½	1¾
C	1½	350	10 x 3¼	2,200	**£70 0 0**	On	1½	1½	1¾	2	2½	3	3
D	2	350	12 x 3½	3,000	**£97 0 0**	application	1½	2	2½	2½	3	3½	3½
E	2½	250	14 x 5	5,000	**£132 0 0**		2½	3½	4	5	5½	6	7
F	3	250	18 x 5	8,000	**£180 0 0**		5	6	7	8	9	10	11
G	4	200	22 x 6	15,000	**£274 0 0**		7	8	9	10	12	14	16

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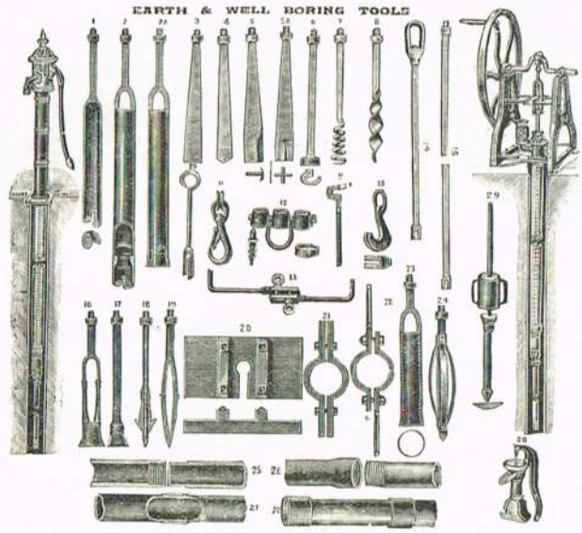
WELL-BORING APPARATUS.

FOR
ARTESIAN OR
PETROLEUM WELLS,

PROSPECTING FOR
MINERALS, COAL, ETC.



FOR
TESTING GROUND
FOR BUILDINGS,
BRIDGES, AND ALL
CONSTRUCTIONAL
WORK.

DESCRIPTION OF TOOLS. Fig. 1785.

1.—Clay Auger for Clay and stiff soils.
2.—Auger Nose Shell, with valve, for bringing up loose and saturated strata from bore hole.
2a.—Shoe Nose Shell, with valve, for bringing up loose and saturated strata from bore hole.
3.—Flat Chisel for moderately hard ground.
4.—V Chisel for moderately hard ground.
5.—Tee Chisel, for hard and rocky strata.
5a.—X Chisel, for hard and rocky strata.
6.—Crow's Foot, for drawing broken rods.
7.—Spiral Worm, for drawing broken rods.
8.—Worm Auger, for loosening strata in bore holes.
9.—Hand Dog, or Rod Wrench.
10.—Lifting Dog, for raising rods.
11.—Spring Hook.
12.—Ironwork for Shear Legs.
13.—Tillers for working rods.
14.—Swivel top Rod.
15.—Well Rod for Boring Rod.
16.—Bell Box, for extracting broken rods or tools.
17.—Bell Screw, for extracting broken rods or tools.
18.—Spring Dart, for drawing out pipes.
19.—Lowering Tee, for lowering one set of pipes through another.
20.—Auger or Dog Board.
21.—Pipe Clambs, for screwing pipes together.
22.—Pipe Tillers, for screwing pipes together.
23.—Circular Chisel, for trimming down bore hole true and vertical.
24.—Cutting Springs, for enlarging bore hole below lining tubes.
25.—Flush Jointed Lining Tubes.
26.—Swelled Jointed Lining Tools.
27.—Steel Socketed Lining Tubes.
28.—Rivetted or Brazed Lining Tubes.
29.—Auger Clearer.

When ordering Boring Tools give full particulars of the class of work, nature of the ground, the probable depth, and the size of the bore hole at the finish. For complete specification and prices of sets see next page. Larger size sets quoted for upon application.

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WELL-BORING TOOLS.

COMPLETE SETS. Fig. 1785.

Set No. 1.

For a small set of Trial Boring Tools for a depth of 30 feet.

One 2″ Clay Auger.
One 2″ Shoe Nose Shell.
One 2″ Flat Chisel.
One 2″ Worm Auger.
One pair of Tillers.
One Lifting Dog.
Two Hand Dogs.
One short Swivel Rod.
Five 60″ x ¾″ Square Boring Rods.
One Spring Hook.
PRICE £11 5 0.
Extra 60″ rods, **12/6** each.

Set No. 2.

For a set of Boring Tools for a depth of 50 feet.

One each 3¼″ and 2½″ Clay Augers.
One each 3″ and 2½″ Shoe Nose Shells.
One each 3¼″ and 2½″ Flat Chisels.
One each 3¼″ and 2½″ Tee Chisels.
One Worm Auger.
Ten 60″ x 1″ Square Boring Rods.
One pair of Tillers.
Two Hand Dogs. Two Lifting Dogs.
One Snatch Block.
One Spring Hook and 30 feet of rope.
One short Swivel Rod. One Auger Board.
One Auger Clearer.
PRICE £26 15 0.
Extra 60″ Rods, **15/6** each.
If without 2½″ Tools, **95**/– less.
One set of iron tubular Shear Legs with Windlass, **£12.**
If with 3¾″ and 2¾″ Tools add **15/-** to above price.

Set No. 3.

For a set of Boring Tools for 100 feet or more.

One each 4¼″ and 3¼″ Clay Augers.
One each 4″ and 3″ Shoe Nose Shells.
One each 4″ and 3″ Auger Nose Shells.
One each 4¼″ and 3¼″ Flat Chisels.
One each 4¼″ and 3¼″ Tee Chisels.
One Worm Auger. One Bell Screw.
Two Lifting Dogs. Two Hand Dogs.
One pair of Tillers. One Snatch Block.
One short Swivel Rod. One Auger Board.
Ten 10′ x 1″ Boring Rods.
One Spring Hook with 30 feet of rope.
PRICE £37 0 0.

Extras.

For a set of ironwork for Shear Legs, **40**/–.

Best iron-bound Well Sinker's Windlass. **COMPLETE £12**

Set of iron Tubular Shear Legs instead of set of ironwork for Shear Legs and Well Sinker's Windlass, **£12.**

Extra 10′ x 1″ Rods, **17/6** each.

Auger Nose Shells omitted from set, less **95**/–.

3¼″ Tools omitted, less **£7 10 0.**

4¼″ Tools omitted, less **£8 15 0.**

3¾″ and 2¾″ Tools supplied in place of 4¼″ and 3¼″, less **20**/–.

Set No. 4.

For a set of Boring Tools for 200 feet or more.

One each 5¼″, 4¼″ and 3¼″ Clay Augers.
One each 5″, 4″ and 3″ Shoe Nose Shells.
One each 5″, 4″ and 3″ Auger Nose Shells.
One each 5¼″, 4¼″ and 3¼″ Flat Chisels.
One each 5¼″, 4¼″ and 3¼″ Tee Chisels.
One Worm Auger. One Bell Screw.
Two Lifting Dogs. Two Hand Dogs.
One pair of Tillers. One Snatch Block.
Twenty 10′ x 1¼″ Boring Rods.
One short Swivel Rod. One Auger Board.
One Spring Hook with 30 feet of rope.
PRICE £65 10 0.

Extras.

One set of ironwork for Shear Legs, **40**/–.

Best iron-bound Well Sinker's Windlass, complete, **£12.**

Set of iron Tubular Shear Legs with gearing fitted with fast and loose pulleys, as well as for hand power, instead of ironwork for Shear Legs and Well Sinker's Windlass, **£22 10 0.**

Extra 10′ x 1¼″ Rods with coupling screws, **22/6** each.

Spare set of Bottom Tools, consisting of one Auger, one Tee, and one Flat Chisel of each size, also three spare Male Screws. **PRICE £13 15 0.**

Auger Shells omitted, less **£7 15 0.**

3¼″ Tools omitted, less **£8 0 0.**

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FANS.

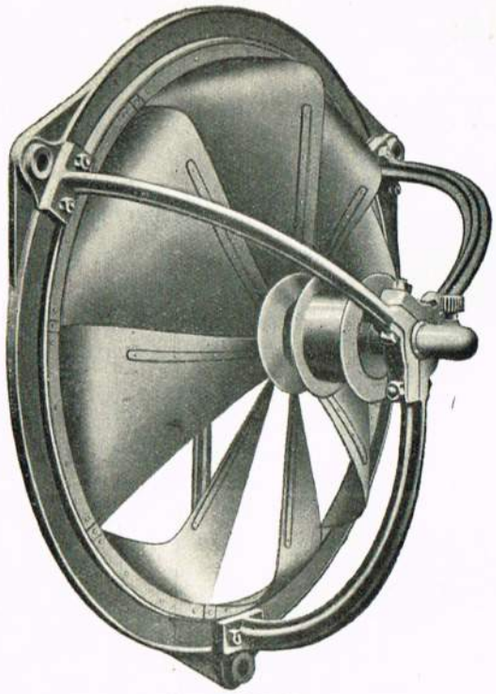

Fig. 1790. BELT-DRIVEN FANS.

This is known as the box-blade fan, and will move large volumes of air at low speeds ; it is suitable for nearly all purposes in which fans are employed.

The above illustration represents the standard design fan, with a belt pulley on the feed side (or inlet to fan) and inside the arms. The fan wheel is arranged to run clockwise when looking at the air inlet side.

The bearings are made of cast-iron, each fitted with a Stauffer screw-down lubricator. It is necessary to state, when ordering, whether the fan will run with horizontal, vertical or inclined spindle.

The fan wheel is made of mild steel, but aluminium or copper blades can be supplied at an extra cost.

Fans up to 18″ diameter inclusive are supplied with double-flanged pulleys ; above 18″ the pulleys are single-flanged.

Vertical or Horizontal Spindles—Right hand wheels.

Diam. of wheel in inches	Area of fan in square feet	Diam. of pulley in inches	Width of belt in inches
15	1·0	2¼	1
18	1·7	3	1½
24	3·1	4	2
30	4·9	5	2½
36	7·0	6	3
42	9·5	7	3½
48	12·5	8	4
54	15·9	10	4½
60	19·6	12	5
66	23·5	13	6
72	28·2	14	6

Vertical or Norizontal spindles—Right hand wheels.

Diam. of wheel in inches	Revs. per minute	Actual h.p. required	Approx. volume of air moved in cubic feet per minute. Free air	Price £	s.	d.
15	1000 to 1500	1/10 to ¼	1000 to 1500	**4**	**0**	**0**
18	700 to 1200	⅛ to ½	1800 to 3000	**6**	**0**	**0**
24	500 to 900	1/6 to ⅝	3000 to 6000	**8**	**0**	**0**
30	450 to 750	¼ to 1	6000 to 9000	**11**	**0**	**0**
36	400 to 700	½ to 1½	8000 to 14000	**13**	**10**	**0**
42	350 to 600	¾ to 2	11500 to 20000	**17**	**10**	**0**
48	300 to 550	1 to 3	14000 to 27000	**23**	**0**	**0**
54	280 to 450	1¼ to 3½	20000 to 33000	**36**	**0**	**0**
60	250 to 400	1½ to 4	24000 to 40000	**50**	**0**	**0**
66	220 to 360	1¾ to 5	28000 to 50000	**72**	**0**	**0**
72	200 to 340	2 to 6	32000 to 60000	**94**	**0**	**0**

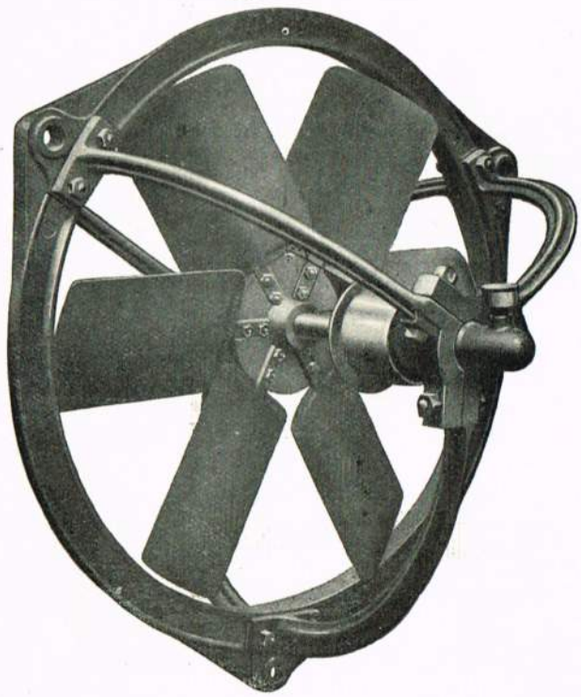

Fig. 1791.

STREAM LINE BELT-DRIVEN REVERSIBLE FANS.

These fans are made in sizes identical with those above, and only vary in the construction of the fan wheel.

The chief features of the " Streamline " fan are :—

(1) It has hollow blades, with the strengthening ribs inside the blades, presenting a smooth surface to the air on both sides, and so shaped as to offer the minimum of resistance to the air, making the fan very efficient, both when working under free air conditions and against resistance. The construction is strong, and the fan can safely be run at high speeds.

(2) The fan wheel gives equal results whether running clockwise or counter clockwise. When running clockwise, looking at the pulley side, the air is fed to the fan from the driving side and reversed when the wheel is running counter-clockwise.

The direction of rotation is reversed quite simply by crossing the driving belt.

Diam. of wheel in inches	Area of fan in square feet	Diam. of pulley in inches	Width of belt in inches
9	0·5	1½	¾
12	0·85	2	⅞
15	1·3	2½	1
18	1·9	3	1½
24	3·4	4	2
30	5.3	5	2½
36	7·5	6	3
42	10·3	7	3½
48	13·5	8	4
54	17·0	10	4½
60	19·8	12	5
66	25·6	13	6
72	30·0	14	6

Vertical or Horizontal Spindles—Right hand wheels.

Revolutions per minute	Actual h.p. required	Approx. volume of air moved in cubic feet per minute Free air	Price £	s.	d.
1400 to 2200	1/20 to 1/12	400 to 650	**3**	**5**	**0**
1100 to 1800	1/20 to ⅛	800 to 1300	**3**	**10**	**0**
900 to 1500	1/12 to ¼	1200 to 2000	**3**	**15**	**0**
800 to 1300	⅛ to ⅜	2000 to 3500	**5**	**0**	**0**
550 to 1000	1/6 to ½	3500 to 6500	**7**	**0**	**0**
500 to 850	¼ to ¾	5500 to 10000	**10**	**0**	**0**
450 to 800	½ to 1¼	9000 to 16000	**13**	**0**	**0**
400 to 700	⅝ to 2	12500 to 22000	**16**	**0**	**0**
350 to 600	¾ to 2½	16000 to 28000	**20**	**10**	**0**
300 to 500	1 to 3	21000 to 34000	**35**	**0**	**0**
280 to 450	1¼ to 3½	26000 to 42000	**45**	**0**	**0**
250 to 420	1½ to 4½	30000 to 52000	**63**	**0**	**0**
220 to 400	1¾ to 5½	35000 to 64000	**80**	**0**	**0**

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SOLDERING IRONS, Etc.

Fig. 1580. Electric Soldering Irons. Light Pattern.
Supplied from 15 to 250 volts.

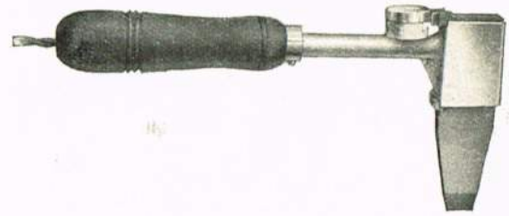

Fig. 1581. Electric Soldering Irons. Heavy Pattern.
Supplied from 32 to 250 volts.

Fix larger flexible cable for low voltages. The cable supplied is only suitable for standard voltages. The heating element can very easily be replaced.

Fig. 1580. Loading in watts, 150. Price complete, **22/6.** Heating Element only, **3/6** each.

Fig. 1581. Loading in watts, 350. Price complete, **26/-.** Heating Element only, **4/-** each.

Fig. 1582.

"Exhibition" Electric Glue Pots. For 100—110, 200—210, 220—230, 240—250 volts. circuit. Other voltages can be supplied at extra cost. Constructed of heavy gauge copper. Both Containers are pure tinned inside. Heating element consists of nichrome resistance wire wound on mica firmly secured. Overheating cannot take place with these pots.

Size. Pints.	Approx. Consumption in Watts.	Approx. Time for Melting. Minutes.	No. of Heats.	Approx. Weight of each. lbs.	Price each. Polished Copper.
½	250	18	1	2½	**£2 9 6**
1	500/250 125	20	3	3½	**£3 4 0**
2½	750/125 250/125	22	4	5	**£3 18 0**
3½	850/500 350/125	25	4	6¾	**£4 19 6**

Fig. 1584.

Sizes, lbs. ...	¼	½	¾	1	1¼	1½	1¾
Price per doz.	**14/-**	**21/8**	**29/8**	**37/4**	**44/8**	**52/4**	**57/4**
Sizes, lbs. ...	2	2½	3	3½	4	4½	
Price per doz.	**64/8**	**70/-**	**75/8**	**96/-**	**106/-**	**116/9**	

Weights given are the Copper Bits and do not include the handle.

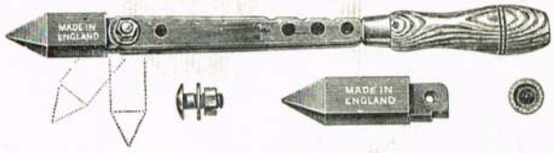

Fig. 1585. Hollow Steel Adjustable Soldering Iron.

	8 ozs.	10 ozs.	12 ozs.	14 oz.	1 lb. and up.
Per doz.	**25/6**	**29/6**	**33/-**	**45/6**	**3/6** to **5/-** lb.

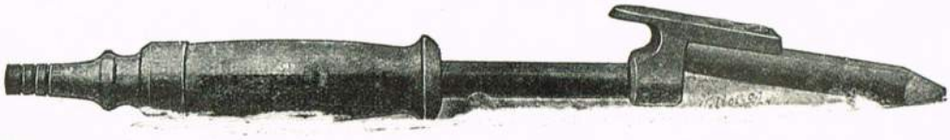

Fig. 1586.

This Gas Iron is free from smell, heats rapidly, and will be found a first-class arrangement for stained glass leading, sardine box making, and similar work. It is not suited for heavy work.

The Copper can be renewed in a minute when worn down. The gas supply from an ordinary bracket, with the gas burner removed, will be found ample. Price, **15/3.**

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VALVE RE-SEATERS.

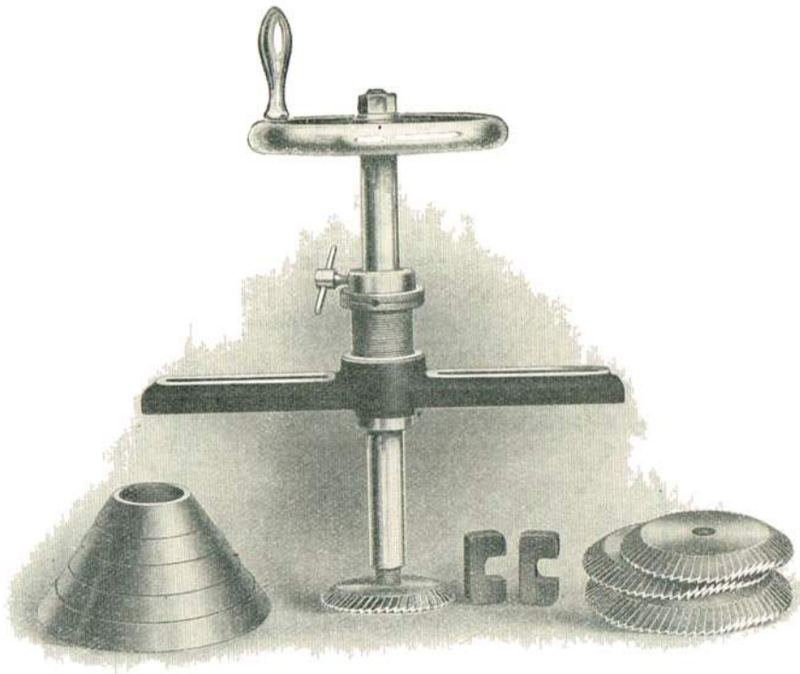

Fig. 1590. VALVE RE-SEATING TOOL for Valves from 2 to 6 diameter.

Set No. 6A.—Complete device, for valve seats, 2″ to 6″, including reversible cutters for valves, 2″, 3″, 4″, 5″, 6″	**£18 0 0**
Set No. 6B.—Complete device as No. 6A, but also including cutters for intermediate sizes, viz., 2½″, 3½″, 4½″, 5½″	**£26 15 0**

SINGLE SIZES AS UNDER:

Set No. 6.—Re-seater, as illustration, without cutters	**£7 0 0**

Spare reversible (flat and bevel) cutters to re-seat valves of following diameters:

	2″	2½″	3″	3½″	4″	4½″	5″	5½″	6″	7″
Price each	**20/–**	**25/–**	**30/–**	**35/–**	**40/–**	**50/–**	**60/–**	**65/–**	**70/–**	**75/–**

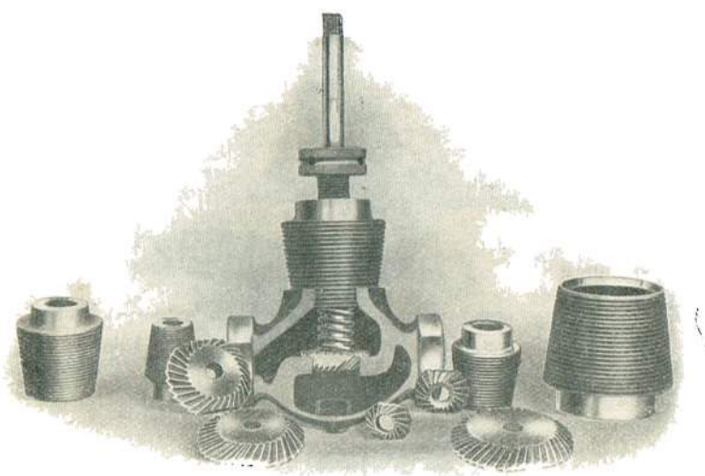

Fig. 1591. VALVE RE-SEATER.

Will re-seat all globe, angle, cross and safety valves, drop and ball check valves of all makes, both flat and taper seats with screw or flange caps, without removing the valve from the pipes, making them absolutely steam-tight.

Can be used by any workman—does not require the aid of a skilled mechanic. The quickest and easiest re-seating tool sold.

The cutters are made reversible, to re-seat flat and bevel valves, and to face down the seat of latter in order to prevent the bevel becoming too wide. This is very necessary for a tight valve.

PRICE LIST.

No. 1.—Complete set for valves ½″ to 2″ consists of 5 tapered cones, 1 brass compression screw, 1 spring, 1 spindle, and 6 reversible cutters	**£6 10 0**
No. 2.—Complete set for valves ¾″ and 1″ consists of 1 tapered cone, 1 brass compression screw, 1 spring, 1 spindle and 2 reversible cutters	**£2 4 0**

No. 3.—Complete sets for valves in single sizes:—
Price each—½″ **17/6**; ¾″ **30/–**; 1″ **31/6**; 1¼″ **35/–**; 1½″ **39/–**; 2″ **44/–**; 2½″ **66/8**; 3″ **80/–**.
Reversible cutters only, price each—½″ **10/–**; ¾″ **11/–**; 1″ **12/6**; 1¼″ **15/–**; 1½″ **17/–**; 2″ **20/–**.
Flange Valve Plate, to adapt the tool to flange valves, price **10/–** each.

SPARE PARTS.

For valves	½	¾	1	1¼	1½	2	inches
Fig. 1. Spindle	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	**2/6**	each
Fig. 2. Brass screw	—	**10/–**	**10/–**	**10/–**	**10/–**	**10/–**	,,
Fig. 3. Spring	—	–/6	–/6	–/6	–/6	–/6	,,
Fig. 5. Cone	**5/6**	**6/6**	**6/6**	**7/6**	**9/6**	**11/6**	,,
Fig. 9. Cutter	**10/–**	**11/–**	**12/6**	**15/–**	**17/–**	**20/–**	,,

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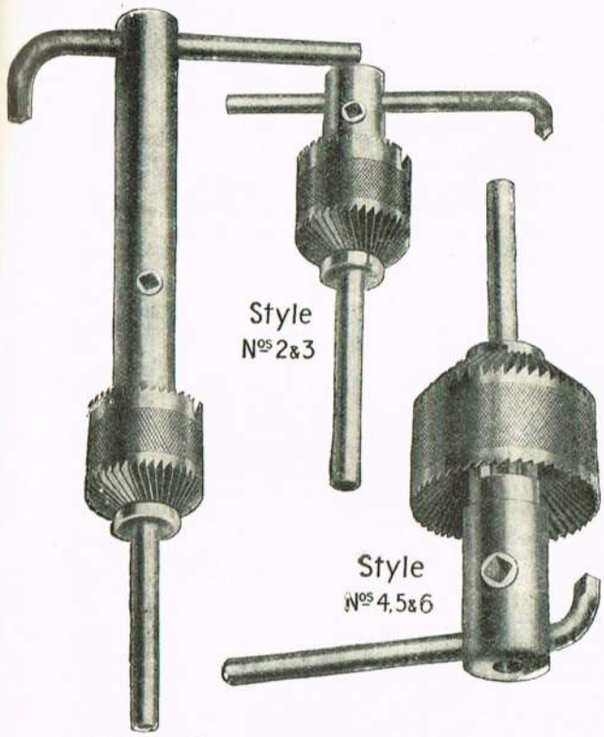
VALVE RE-SEATERS.

Fig. 1592. COMBINED RE-SEATER FOR VALVES AND VALVE SEATS.

Valve Seating Equipment for motor cars can be used on all types of motor engines. Suitable for motor-cycle, automobile, tractor, or internal combustion engines, using Poppet valves. In many engines the valve guides are loosely fitted. These tools rectify this inaccuracy, as the cutter is always at a true angle with the valve guide bush. The cutter is of oil-hardening steel, tempered to a glass-hard condition, with internal teeth for re-facing the valve, and external teeth for re-facing the valve seating. Before using first rough file the carbon deposit. The cutter will correct any file scratches afterwards. Apply even, steady pressure, completing the circle. Avoid jerky moves.



Style No. 1.

No. 1—For all valves under $1^5/_{16}''$ diameter. Illustrates a long-handled style for very deep ports.

No. 2.—For valves $1\frac{1}{2}''$ diameter and less.

No. 3.—For valves $1\frac{3}{4}''$ diameter and less.

No. 4.—For valves $2''$ diameter down to $1\frac{1}{4}''$.

No. 5.—For valves $2\frac{1}{4}''$ down to $1\frac{1}{2}''$.

No. 6.—For valves $2\frac{1}{2}''$ diameter down to $1\frac{3}{4}''$.

Nos. 7 to 12.—For larger valves up to $4''$ diameter.

Prices and Sizes of Re-seaters.

Size No.	For valves from	down to	Standard stem	Alternative Stems and bushes available	Price £ s. d.
1	$1^{19}/_{64}''$	$^{49}/_{64}''$	$^5/_{16}''$	$^5/_{16}''$, 7, 8 or 9 m/m ...	**2 2 0**
2	$1^{31}/_{64}''$	$^{49}/_{64}''$	$^5/_{16}''$	$^5/_{16}''$, 7, 8 or 9 m/m ...	**2 10 0**
3	$1^{47}/_{64}''$	$1^{15}/_{64}''$	$^5/_{16}''$	$^5/_{16}''$, $^3/_8''$ 7, 8, 9, 10, 11 m/m ...	**2 16 3**
4	$1^{63}/_{64}''$	$1^9/_{64}''$	$^3/_8''$	As No. 3	**3 5 8**
5	$2^{15}/_{64}''$	$1^{17}/_{64}''$	$^3/_8''$	As No. 3	**3 15 0**
6	$2^{35}/_{64}''$	$1^{33}/_{64}''$	$^7/_{16}''$	$^5/_{16}''$, $^3/_8''$, $^7/_{16}''$, $^1/_2''$, $^9/_{16}''$, 11, 12 m/m	**4 10 0**
7	$2^{47}/_{64}''$	$1^{49}/_{64}''$	$^1/_2''$	$^7/_{16}''$, $^1/_2''$, $^9/_{16}''$, 11, 12 m/m	**5 5 0**
8	$2^{63}/_{64}''$	$2^1/_{64}''$	$^1/_2''$	$^7/_{16}''$, $^1/_2''$, $^9/_{16}''$, $^5/_8''$, $^{11}/_{16}''$, $^3/_4''$	**6 0 0**
9	$3^{15}/_{64}''$	$2^{17}/_{64}''$	$^1/_2''$	Ditto	**6 15 0**
10	$3^{31}/_{64}''$	$2^{33}/_{64}''$	$^1/_2''$	,, ...	**7 10 0**
11	$3^{47}/_{64}''$	$2^{49}/_{64}''$	$^1/_2''$	,, ...	**8 5 0**
12	$3^{63}/_{64}''$	$3^1/_{64}''$	$^1/_2''$	,, ...	**9 0 0**

Supplied for any make or size automobile, truck, or motor cycle.

Note.—The diameters given above are the actual diameters of the cutter and are effective for valves up to $^1/_{64}''$ less, for instance No. 4—$2''$ diameter serves for valves up to $1^{63}/_{64}''$ only.

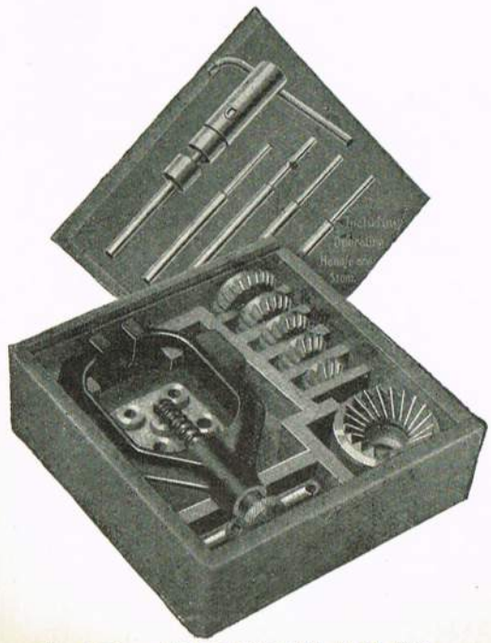


Fig. 1593. Garage Sets with Hand Vice.

Fig. 1593. Prices of Garage Sets.

No. 3 Garage Set.

Trues all valves and seats from $1''$ inside diameter to $1\frac{3}{4}''$ outside diameter. Contains: One $1\frac{3}{4}''$ valve cutter; one hand vice; one each seating cutters $1^9/_{32}''$, $1^5/_{16}''$, $1^9/_{16}''$, $1^{13}/_{16}''$; one each pilots and bushes $\frac{1}{4}''$, $^9/_{32}''$, $^5/_{16}''$, $^3/_8''$ and 7 m/m. One master operating handle.

Price ... **£5 0 0.**

No. 4 Garage Set.

Trues all valves and seats from $1\frac{3}{8}''$ inside diameter to $2^9/_{16}''$ outside diameter. Contains: One $2^9/_{16}''$ valve cutter; one hand vice; one each seating cutters $1^9/_{16}''$, $1^{13}/_{16}''$, $2^1/_{16}''$, $2^5/_{16}''$, $2^9/_{16}''$; one each pilots and bushes $^5/_{16}''$, $^3/_8''$, $^7/_{16}''$, 9 m/m, 10 m/m; one master operating handle.

Price ... **£6 10 0.**

No. 5 Garage Set.

Trues all valves from $1''$ inside diameter to $2^9/_{16}''$ outside diameter. Contains all the tools in Set No. 4 with the following in addition: One $1\frac{3}{4}''$ valve cutter; one extra $1^5/_{16}''$ seating cutter.

Price ... **£8 12 0.**

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SCRAPERS, VALVE GRINDERS, Etc.

Fig. 1594.

B.—Flat scraper for surface work.

C.—Straight, half-round for general use.

D.—Curved half-round.

A.—Hollow ground triangular.

A handy set of engineers and tool-makers scrapers. Handles are knurled. Light but strong. Blades are made of best cast steel and ground after hardening.

Fig. 1595.

A complete outfit of engineers' scrapers, with wood handles. The blades are new forged steel, and not made out of old files.

The shapes and the curves have been very closely studied before finally deciding on the exact form, and we feel sure they will meet with the practical approval of all actual users. The shapes are three-square, flat, and two sizes of curved half-round. The edges of the latter have been rounded off at the lower end of the blade in order to make them more comfortable to use, and the extreme point has been rounded off at the correct radius for cleaning out and deepening oil grooves. They will be found to cover a greater range of jobs than any scrapers of their class.

Fig. 1595.

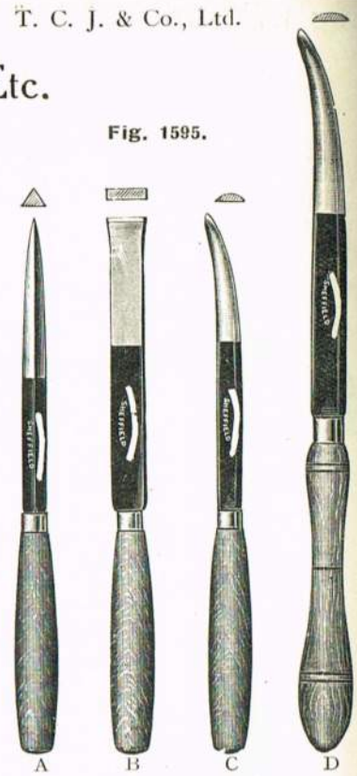

Fig. 1594.	Type B	Type C	Type D	Type A	Price each	Price per set of 4
Length, inches	6	6	6	6	**2/3**	**9/–**
,, ,,	10	10	10	10	**2/6**	**10/–**
,, ,,	12	12	12	12	**3/–**	**12/–**

Fig. 1595.	Type A	Type B	Type C	Type D	Price set of 4	Price one each	Price one each of four
Length blade inches	4	4	4	5		A B C all 4″ long	Type C from 4″ to 8″ long
Price each ...	**1/2**	**1/2**	**1/2**	**1/6**	**5/–**		
Length blade inches	5½	6	6	8			
Price each ...	**1/6**	**1/6**	**2/–**	**2/3**	**7/3**	**3/6** set	**7/–** set

Fig. 1596. GOODELL VALVE GRINDER.

These tools will be found a great convenience in grinding utomobile valves. Although this was formerly drudgery, t is now done easily and rapidly with these tools. By neans of a simple operating mechanism, the spindle is aused to rotate back and forth when the crank is turned ontinuously in one direction.

The tools are designed to have sufficient weight so that dditional pressure need not be applied to the valve seat.

Both an adjustable spanner and a blade are provided vith each of these tools in order that they may be used on ifferent types of cars. Length over all 10¼″.

		Price each
Vo. 288.	Enamelled iron frame, weight 3¾ lbs.	**14/7**
Vo. 467.	Polished aluminium frame, weight 2¼ lbs.	**18/9**

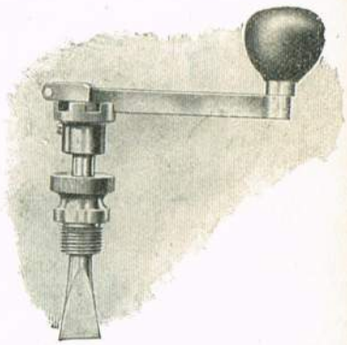

Fig. 1597. PATENT VALVE GRINDER

Fitted with castle head to obtain easy movement in awkward positions. Milled screw fits into sparking plug hole. Spring is provided for each tool.

Price ... **6/–** each.

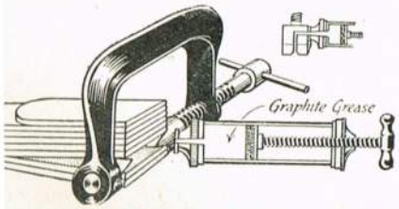

Fig. 1598. PATENT GREASE INJECTOR.

A most useful and efficient tool. The only ool which will grease between the leaves of prings with ease, rapidity and with cleanliess.

Motor car size	...	**27/–** each
Lorry size	...	**34/–** ,,

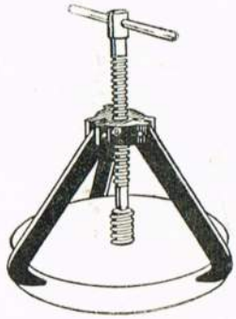

Fig. 1599.

PATENT DREADNOUGHT PULLEY REMOVER OR WHEEL PULLER.

A necessary tool in every garage equipment. Strongly made to stand hard wear.

Standard size to take pulleys 2″ to 7″	**15/–**
Special for fly-wheels for motor cycles	**15/–**

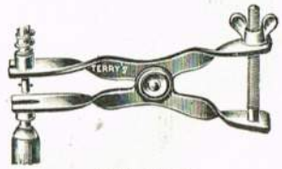

Fig. 1600.

MOTOR CAR VALVE LIFTER.

A perfect and reliable device of simple construction. Is adjustable, practical and durable. Leaves both hands free to take out valve spring pin.

Price ... **3/–** each.

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WHEEL STAND, Etc.

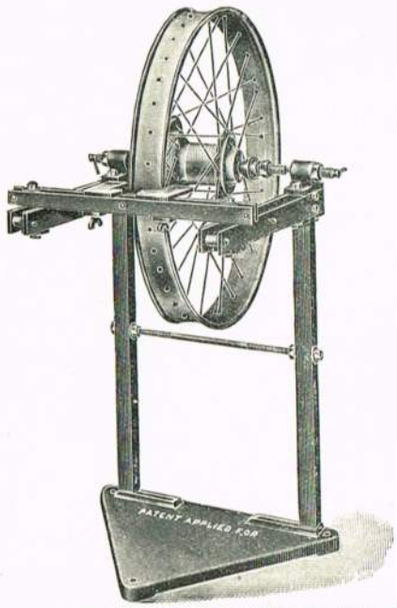

Fig. 1605. ADJUSTABLE WIRE WHEEL TRUEING STAND,

With solid square legs. The uprights and tie-rods of stand are adjustable to allow any spindle length. The rim trueing plates are easily and quickly adjusted to take cycle, motor-cycle or motor-car wheels. Size No. 1, without spindle or cones, for cycle and motor-cycle wheels, Price **95**/- each.

Size No. 2, fitted with spindle and cones to take any type of motor-car wheel, as illustrated. Price **110**/- each.

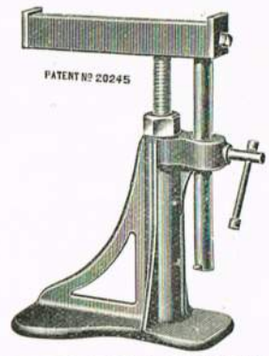

Fig. 1606. ADJUSTABLE CHASSIS PEDESTALS.

These useful tools are manufactured from high-grade materials and should form a part of every garage and repair shop equipment. Quickly and easily adjusted, they supply a long-felt want. They can be used for many purposes other than chassis stands. The adjustment is performed by a deep cut screw, operated by a nut and fastened with pinch-bar and vice handle. Swivel plates are fitted to the end of the arm to prevent the slipping of the chassis. The No. 2 size is of heavy pyramidal design, for carrying the heaviest of frames.

	Height, inches Down	Up	Price each
No. 1.—For Ford or light cars ...	10	16	**16**/-
No. 2.—For large cars and commercial vehicles	18	30	**80**/-

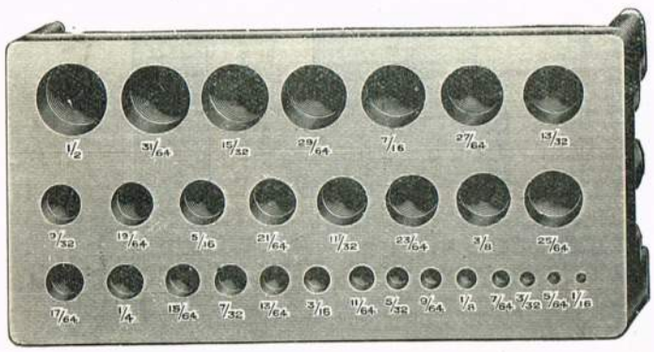

Fig. 1607. "BENCOWAT" TWIST DRILL STAND.

Also serves as a gauge. Each hole is marked in raised figures.
Size No. 1.—Takes 29 drills, $^1/_{16}''$ to $\frac{1}{2}''$ in $^1/_{64}$ths. Price **4/6** each.
Size No. 2.—Takes 60 letter gauge drills, Nos. 1—60. Price **5/6** each.

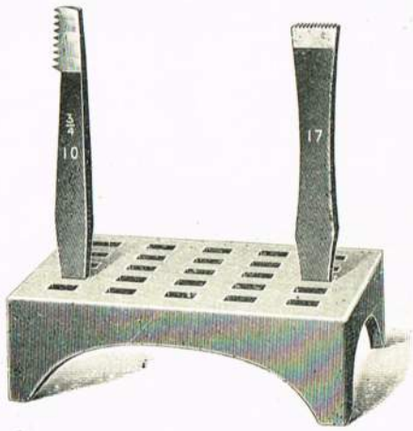

Fig. 1608. CHASER STAND.

Holes will take any size tang. The stand is well finished, and will hold 25 tools.

Price ... **4/6** each.

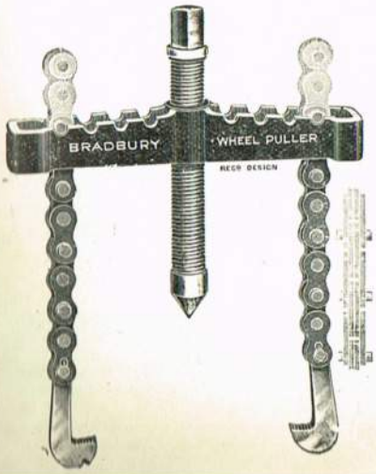

Fig. 1609.

PATENT ADJUSTABLE PULLER.

For removing wheels, pulleys, gears, fly-wheels, etc., of every description. Indispensable in every garage and engineering workshop. Great power. Easy adjustment. Has hardened nose-piece, which prevents damage to end of axle or spindle. The frame is a heavy design drop-forging, the centre screw of best quality nickel steel. Two chains of ample proportion; at the end of each is provided a cast steel hook or claw, suitably cut to prevent slipping.

No. 1—Price **48**/- each.

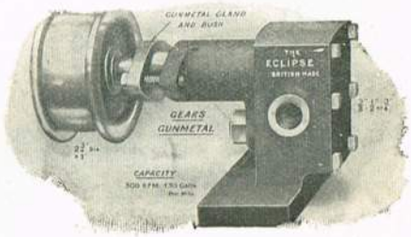

Fig. 1610. SUD PUMP, fitted with bye pass and gun metal wheels, gland and bush. Capacity $\frac{3}{8}''$. Price **18/6** each

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ENGINE STANDS AND MOULDS.

Fig. 1611. PATENT ENGINE STANDS.

Fitted with or without swing over attachment. If without swing over attachment top the two side bars are slotted to take the holding down engine bolts. Can be used for gear boxes and other heavy machinery under repair.

No.	Height ins.	Length ins.	Side adjustment ins.		Price
1	30	48	24	Without swing over frame	£2 10 0
2	30	48	24	With swing over frame ...	£3 13 6
3	24	60	36	With swing over frame and 2 swivel castors ...	£4 10 0
4	30	48	36	Commercial size, as illustrated, but without swing over frame	£4 4 0
5	30	48	36	As illustrated, with swing over frame	£5 5 0
6	33	60	48	Heavy Commercial, with swing over frame and 2 swivel castors	£8 10 0

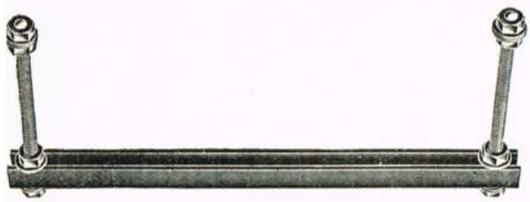


Fig. 1612. THREE-POINT SUSPENSION BAR, and CLEATS,

For attaching to the above engine frames. Adjustable in width and depth.

Prices of Bars.

No. 1A.	To fit above stands 1, 2, 4, 5	10/9
No. 1B.	,, ,, 6	12/–

Prices of Cleats. Set of 4, with bolts.

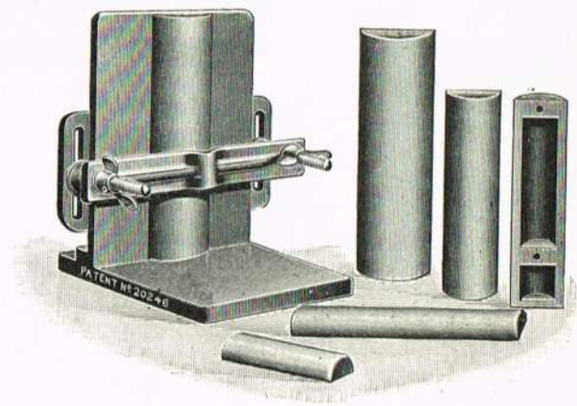
No. 2A.	To fit stands Nos. 1, 2, 4, 5	10/–
No. 2B.	,, ,, No. 6	12/6

Fig. 1613. VARIABLE ENGINE BEARING MOULDS.

A simple, efficient and convenient method of re-turning bearings with white metal. A great saving of time and labour. Supplied with interchangeable cones.

A necessity in every workshop and garage.

Set No. 1.	No. of cores.	Size of cores, inches	Price per set
1 ...	6	¾, 1, 1¼, 1½, 1¾, 2 × 3½ inches in length ...	17/–
2 ...	4	1¼, 1½, 1¾, 2 × 6 inches in length	31/6
3 ...	4	1½, 2, 2½, 3 × 8 inches in length	45/–
4 ...	6	1×3½, 1¼×6½, 1½×6½, 1¾×6½, 2×8, 2½×8 inches	45/–



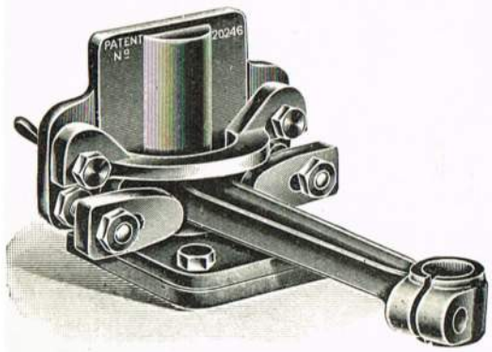
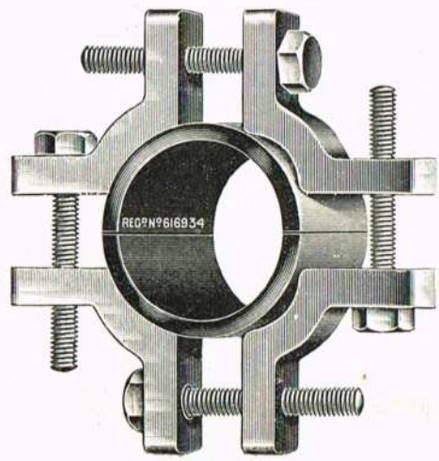


Fig. 1614. VARIABLE MOULDS

or re-lining Ford, Fordson Tractor and other connecting rods.

No. 5. Ford size ... ... 13/6 each
No. 6. Fordson size ... ... 13/6 ,,



Closed.

Fig. 1615. BEARING CLAMP.

Holds the bearing securely for machining subsequent to relining. Similar to a 4-jaw chuck. Is useful for many small engineering jobs. Will accommodate itself to any section.

No. 1. Size of hole when enclosed, 1″
No. 1. ,, ,, ,, extended, 3″
Price ... 4/6 each.

No. 2. Size of hole when closed, 2″.
No. 2. ,, ,, ,, extended 4½″.

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HACK SAW BLADES.

Fig. 1620. HACK SAW BLADES.

Hand Blades.

14, 18, 22, 32 teeth.

Size inches	Gauge	Price per gross £ s. d.
6 × 7/8	23	1 10 0
7 × 7/16	23	1 11 3
8 × 7/16	23	1 13 4
9 × 1/2	23	1 17 6
10 × 1/2	23	2 1 8
11 × 1/2	23	2 5 10
12 × 9/16	23	2 12 6
12 × 1/2	23	2 10 0
13 × 9/16	23	2 17 6
14 × 5/16	23	3 2 6
16 × 9/16	23	3 12 6

Light Power Blades.

21 gauge, 14 teeth } 16, 18, 22
22 ,, ,, } teeth to order.
18 ,, 10 and 14 teeth.
16 ,, 10 teeth.

Size inches	Gauge	Price per gross £ s. d.
8 × 9/16	22	1 17 6
9 × 9/16	22	2 0 0
10 × 5/8	22	2 2 6
10 × 3/4	21	2 16 3
10 × 3/4	18	4 1 3
11 × 5/8	22	2 7 6
12 × 5/8	21	3 0 0
12 × 5/8	18	4 0 0
12 × 3/4	21	3 7 6
12 × 3/4	19	4 7 6
12 × 3/4	18	4 17 6
12 × 1	18	6 2 6
12 × 1	19	7 17 6

Medium Power Blades.

21 gauge, 14 teeth } 16, 18, 22
22 ,, ,, } teeth to order.
18 ,, 10 and 14 teeth.
16 ,, 10 teeth.

Sixe inches	Gauge	Price per gross £ s. d.
13 × 1	18	6 12 9
14 × 5/8	21	3 10 0
14 × 3/4	21	3 18 9
14 × 3/4	18	5 13 9
14 × 1	21	5 10 10
14 × 1	18	7 2 11
14 × 1	16	9 3 9
15 × 3/4	18	6 1 9
15 × 3/4	21	4 4 6
15 × 1	18	7 12 0
16 × 3/4	21	4 10 0
16 × 3/4	18	6 10 0
16 × 1	18	8 3 4
16 × 1	16	10 10 0
17 × 3/4	21	4 15 7
17 × 1	18	8 13 6
17 × 1	16	11 3 1
18 × 1	18	9 3 9
18 × 1	16	11 6 3
19 × 1	18	9 3 11
19 × 1	16	12 9 4
20 × 1	18	10 4 2
20 × 1	16	13 2 4
21 × 1	18	10 14 4
21 × 1	16	13 15 7
22 × 1	18	11 4 7
22 × 1	16	14 8 9
23 × 1	18	11 14 9
23 × 1	16	15 1 10
24 × 1	18	12 5 0
24 × 1	16	15 15 0

Heavy Power Blades.

6 and 10 teeth.

Length ins.	Width ins.	18 gauge £ s. d.	17 gauge £ s. d.	16 gauge £ s. d.	15 gauge £ s. d.
12	1 1/4	7 17 6	9 12 6	10 12 6	—
13	1 1/4	8 10 7	10 8 7	11 10 3	12 13 0
14	1 1/4	9 3 9	11 4 7	12 7 11	13 13 0
16	1 1/4	10 10 0	12 16 8	14 3 4	15 12 0
17	1 1/4	11 3 1	13 12 8	15 1 0	—
18	1 1/4	11 16 3	14 8 9	15 18 9	—
19	1 1/4	12 9 4	15 4 9	16 16 5	—
20	1 1/4	13 2 6	16 0 10	17 14 2	—
21	1 1/4	13 15 7	16 16 10	18 11 10	—
22	1 1/4	14 8 9	17 12 11	19 9 7	—
23	1 1/4	15 1 11	18 9 0	20 7 4	—
24	1 1/4	15 15 0	19 5 0	21 5 0	—
12	1 1/2	10 7 6	11 7 6	12 10 0	—
13	1 1/2	11 4 10	12 6 6	13 10 10	—
14	1 1/2	12 2 1	13 5 5	14 11 8	—
16	1 1/2	13 16 8	15 3 4	16 13 4	18 7 0
17	1 1/2	14 14 0	16 2 4	17 14 2	—
18	1 1/2	15 11 3	17 1 3	18 15 0	20 13 0
19	1 1/2	16 8 7	18 0 3	19 15 10	—
20	1 1/2	17 5 10	18 19 2	20 16 8	22 18 0
21	1 1/2	18 3 4	19 18 1	21 17 6	—
22	1 1/2	19 0 5	20 17 1	22 18 4	—
23	1 1/2	19 17 9	21 16 0	23 19 2	—
24	1 1/2	20 15 0	22 15 0	25 0 0	—
26	1 1/2	—	—	27 1 8	—
28	1 1/2	—	—	29 3 4	—
30	1 1/2	—	—	31 5 0	—
32	1 1/2	—	—	35 18 9	—

Extra Heavy Power Blades.

On mild steel ...18 ga. 6 teeth
...17 ga. 6 ,,
...16 ga. 6 ,,

On hard steel and structural steel 10 teeth
10 ,,

Length ins.	Width ins.	Prices £ s. d.	£ s. d.	£ s. d.	£ s. d.
12	2	14 0 0	15 12 6	17 10 0	—
13	2	15 3 4	16 18 6	18 19 2	—
14	2	16 6 8	18 4 7	20 8 4	—
16	2	18 3 4	20 16 8	23 6 8	—
17	2	19 16 8	22 2 8	24 15 10	—
18	2	21 0 0	23 8 9	26 5 0	—
19	2	22 3 4	24 14 9	27 14 2	—
20	2	23 6 8	26 0 10	29 3 4	—
21	2	24 10 0	27 6 11	30 12 6	—
22	2	25 13 4	28 12 11	32 1 8	34 2 6
23	2	26 16 8	29 19 0	33 10 10	—
24	2	28 0 0	31 5 0	35 0 0	37 8 0
26	2	—	—	37 0 0	40 14 0
28	2	—	—	40 0 0	44 0 0
30	2	—	—	43 0 0	47 6 0
32	2	—	—	47 0 0	50 12 0

Fig. 1621. ALL-HARD HACK SAW BLADES.

Hand Sizes.

Length ...	8	9	10	11	12	14
Price per gross	33/4	37/6	41/8	45/10	50/–	62/6

Machine Sizes.

12 × 5/8 × 21 gauge	60/– per gross.
12 × 3/4 × 21 ,, ...	67/6 ,,
14 × 5/8 × 21 ,, ...	70/– ,,
14 × 3/4 × 21 ,, ...	78/9 ,,

Fig. 1622. Rail Saw Blades.

For rail cutting machines.

Prices upon receipt of specification.

BOTH EDGES MAY BE USED

WAVY TEETH – CENTRE PORTION OF BLADE IS SOFT.

Fig. 1623. Double-Edged Hack Saw Blades.

Middle of blade is flexible. Made in 22 teeth, and blades are 1″ wide.

Length, inches	8	9	10	11	12	13
Price per gross	56/–	60/–	66/6	73/–	79/–	90/–

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HACK SAWS.

Fig. 1624. "STARRETT" HACK SAWS.

No. 103. With Regular Teeth, 18 to the inch, for general use.

General purpose blades.—For all solids, tool steels, wrought iron, cast iron and slate.

The 6″, 7″, 8″ and 9″ saws are $^7/_{16}$″ wide, .025 thick; the 10″, 11″ and 12″ are ½″ wide .025 thick.

PRICES.

Length inches	6	7	8	9	10	11	12
Per gross ...	**29/3**	**31/3**	**33/6**	**37/6**	**41/9**	**46/–**	**50/–**

No. 103A. Length 12″, width $^9/_{16}$″, .025 thick, with 14 teeth to the inch.

Price per gross ... **50/–.**

No. 103B. The same as No. 103, except that they are made with 14 teeth to the inch, but made in 8″, 9″, 10″ and 12″ lengths only. Especially adapted for cutting cold-rolled stock and soft metals. Prices the same as for No. 103.

No. 102. With Fine Teeth. 24 to the inch.

For sawing tubing, brass, copper and sheet metal, and cutting light angle irons, wrought iron pipe, electrical casing, tool steels, and brass. The 6″, 7″, 8″ and 9″ are $^7/_{16}$″ wide, .025 thick. The 10″, 11″ and 12″ are ½″ wide, .025 thick.

PRICES.

Length, inches	6	7	8	9	10	11	12
Per gross ...	**29/3**	**31/3**	**33/6**	**37/6**	**41/9**	**46/–**	**50/–**

No. 253. Extra Fine Teeth. 32 to the inch.

For cutting brass tubing, sheet steel, and all thin metals. The 8″ and 9″ are $^7/_{16}$″ wide, .025 thick. The 10″ and 12″ are ½″ wide, .025 thick.

PRICES.

Length, inches ...	8	9	10	12
Per gross ...	**33/6**	**37/6**	**41/9**	**50/–**

No. 112. Regular Teeth, 18 to the inch, for light power or hand machines.

The No. 112 saws are ⅝″ wide, .030″ thick. Experience has taught us that these blades are of the correct width and thickness for general use either in light power machines or hand frames, especially where 12″ blades are required. More weight can be used on them, they will stand more rough usage, and do far more work than thinner and narrower blades, particularly when used in power machines.

PRICES.

Length, inches	8	9	10	12	14
Per gross ...	**37/6**	**40/–**	**42/6**	**52/6**	**67/6**

No. 112B. The same as No. 112, except that they are made with 14 teeth to the inch. Especially adapted for cutting cold-rolled stock and soft metals. We also recommend this saw for rail-cutting. Prices the same as for No. 112.

No. 250. Flexible Back, with 18 teeth to the inch.

Especially recommended for difficult sawing where the saw is liable to be strained or used by unskilled labour.

The 8″ and 9″ are $^7/_{16}$″ wide, .025″ thick. The 10″, 11″ and 12″ are ½″ wide, .025″ thick.

PRICES.

Length, inches ...	8	9	10	11	12
Per gross	**33/6**	**37/6**	**41/9**	**46/–**	**50/–**

No. 250B. Similar to No. 250, but made ⅝″ wide, .030″ thick, and in 12″ and 14″ lengths only, with 14 teeth to the inch.

PRICES.

Length, inches	12	...	14
Per gross	**52/6**	...	**67/6**

No. 252. Flexible Back. 24 Teeth to the inch.

For sawing tubing, brass, copper and sheet metal. The 8″ and 9″ are $^7/_{16}$″ wide, .025″ thick. The 10″, 11″ and 12″ are ½″ wide, .025″ thick.

PRICES.

Length, inches ...	8	9	10	11	12
Per gross	**33/6**	**37/6**	**41/9**	**46/–**	**56/–**

No. 258. With Flexible Back. 32 Teeth to inch.

For sawing thin sheet metal and tubing. The 8″ and 9″ are $^7/_{16}$″ wide, .025″ thick. The 10″, 11″ and 12″ are ½″ wide, .025″ thick.

PRICES.

Length, inches ...	8	9	10	11	12
Per gross	**33/6**	**37/6**	**41/9**	**46/–**	**50/–**

No. 114. 14 Teeth to inch. Power Blades.

The No. 114 saws are ¾″ wide, .032″ thick. They are hardened throughout, and are adapted especially for work in light or medium power machines. The lengths given for No. 114 saws refer to distance from centre to centre of holes, except in 14″ and 17″, which are 13½″ and 16½″ respectively from centre to centre of holes.

PRICES.

Length, inches ...	10	12	14	16	17
Per gross	**56/3**	**67/6**	**78/9**	**90/–**	**95/9**

No. 115. 24 Teeth to inch. Light Power Blades.

No. 115 saws are ¾″ wide, .032″ thick, and are hardened throughout. The 12″ saws measure 12″ from centre to centre of holes, and the 14″ measure 13½″ from centre to centre of holes. For cutting electrical conduit, pipe, brass stock, light angle iron and channel iron.

PRICES.

Length, inches	10	12	14
Per gross	**56/3**	**67/6**	**78/9**

No. 115B. The same as our No. 115, except that they have 18 teeth to the inch. For use in medium weight power machines to cut angle iron, I-beams, and wrought iron pipe.

Prices same as for No. 115.

No. 262. 18 Teeth to the inch. High Speed Blades.

These saws are ¾″ wide, .049″ thick, and are hardened throughout.

The 12″ saws measure 12″ from centre to centre of holes, and the 14″ saws measure 13½″ from centre to centre of holes.

For cutting angle iron, brass and general line of ornamental iron work, I-beams and steel rail.

PRICES.

Length, inches	12	...	14
Per gross	**87/6**	...	**113/9**

No. 255. 14 Teeth to Inch. High Speed Blades.

These saws are ¾″ wide, .049 thick, are hardened throughout and especially adapted for cutting high speed steel, tool steel, and cast iron. The lengths given refer to distance from centre to centre of holes, except in the 14″ and 17″ lengths, which are 13½″ and 16½″, respectively, from centre to centre of holes.

No. 255B. The same as No. 255 except that they have 12 teeth to the inch, tempered specially for cutting cold rolled and machinery steel. Made only in 10″, 12″, 14″, 16″ and 17″ lengths.

No. 255C. The same as No. 255B except that they have 10 teeth to the inch. For use in high-speed machines to cut cold rolled stock and machinery steel. Made only in 10″, 12″, 14″ and 17″ lengths.

PRICES. Nos. 255, No. 255B, No. 255C.

Length, inches	10	12	14	16	17	18	19	20
Per gross ...	**81/3**	**97/6**	**113/9**	**130/–**	**138/3**	**146/3**	**154/6**	**162/6**

No. 254. 12 Teeth to inch. High Speed Blades.

The No. 254 saws are 1″ wide, .049″ thick. These blades are hardened throughout and are especially adapted for cutting high speed steel, tool steel and cast iron. The lengths given refer to distance from centre to centre of holes, except in the 14″ and 17″ lengths, which are 13½″ and 16½″, respectively, from centre to centre of holes.

PRICES. No. 254, No. 254B, No. 254C.

Length, inches	12	14	16	17	18	19
Per gross	**122/6**	**143/–**	**163/6**	**173/9**	**183/9**	**194/–**

Length, inches ...	20	21	22	23	24
Per gross	**204/3**	**214/6**	**224/9**	**235/–**	**245/–**

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HACK SAWS.

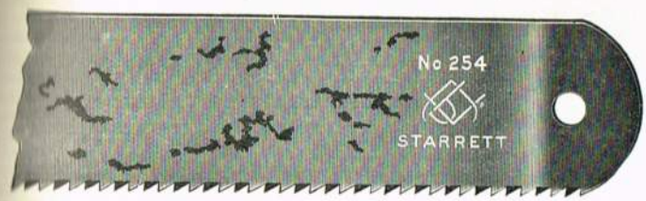

Fig. 1625. STARRETT HACK SAWS.

No. 254B.—Same as No. 254 except that they have 10 teeth to the inch tempered specially for cutting cold rolled and machinery steel. Made only in 12″ 14″, 16″, 17″, 18″, 19″, 20″ and 24″ lengths.

No. 254C.—The same as our No. 254B, except that they have 8 teeth to the inch, and are made only in 12″, 14″, 17″ and 18″ lengths. Specially recommended for cutting mild steel in heavy power machines.

No. 256. 12 Teeth to inch. High Speed Blades.

These saws are 1″ wide, .065″ thick, and are hardened throughout. The lengths given refer to the distance from centre to centre of holes, except in the 17″ size which measures 16½″ from centre to centre of holes, and are specially adapted for cutting high speed steel, tool steel and cast-iron.

No. 256B.—The same as No. 256, except that they have 10 teeth to the inch, tempered specially for cutting mild steel.

For use in extra heavy power machines.

No. 256C.—The same as No. 256B, except that they have 8 teeth to the inch. For use in extra heavy power machines, in cutting heavy structural iron and mild steel.

PRICES, No. 256, No. 256B, No. 256C.

Length, inches ...	14	16	17
Per gross	£9 3 9	£10 10 0	£11 3 3
Length, inches ...	18	20	24
Per gross	£11 16 3	£13 2 6	£15 15 0

No. 259. 18 Teeth to inch. Heavy Power Blades.

No. 259 saws are 1″ wide, .049″ thick, hardened throughout. The 14″ saws measure 13½″ from centre to centre of holes, and the 17″ saws measure 16½″ from centre to centre of holes. For cutting iron, iron pipe, structural iron, channel iron, I-beams, automobile frames, etc.

PRICES.

Length, inches	14″	17″
Per gross	£7 3 0	£8 13 9

Fig. 1626. HACK SAW BLADES with Teeth set to cut both forward and reverse direction. Hand Blades. 16 and 24 Teeth.

Machine Blades, 16 and 11 Teeth per inch.

Hand Sizes.													
Length, inches ...	6	7	8	9	10	11	12	12	13	14	16		
Gauge ...	23	23	23	23	23	23	23	23	23	23	23		
Width, inches ...	7/16	7/16	7/16	½	½	½	9/16	½	9/16	9/16	9/16		
Price per gross ...	30/–	31/8	33/4	37/6	41/8	45/10	52/6	50/–	57/6	62/6	72/6		
Machine Sizes.													
Length, inches ...	12	12	12	12	14	14	16	17	17	24			
Gauge ...	21	21	18	18	18	18	18	18	16	16			
Width, inches ...	⅝	¾	¾	1	¾	1	1	1	1	1			
Price per gross ...	60/–	67/6	97/6	122/6	113/9	142/11	163/4	173/6	223/1	315/–			

Fig. 1627. FIRTH'S DIE-HARD HACK SAWS.

Hand and Light Power Blades.

14, 16, 18, 22, 28, 32 teeth.

Size, inches	Gauge.	Price per gross £ s. d.
8×7/16	23	1 13 4
8×½	23	1 13 4
9×7/16	23	1 17 6
9×½	23	1 17 6
10×½	23	2 1 8
10×⅝	22	2 2 6
11×½	23	2 5 10
11×⅝	22	2 7 6
12×½	23	2 10 0
12×9/16	22	2 12 6
12×⅝	22	2 12 6
13×9/16	22	2 17 6
14×9/16	22	3 2 6

Heavy Power Blades.

Size ins.	Gauge	Teeth.	Price gross £ s. d.	Size ins.	Gauge	Teeth.	Price gross £ s. d.
10×¾	21	14, 16, 18, 22	2 16 3	17×1	18	6, 8, 10, 14	8 13 6
10×¾	18	8, 10, 14	4 1 3	17×1	17	6, 8, 10	9 18 4
10×1	21	14, 16, 18, 22	3 19 2	17×1	16	6, 8, 10	11 3 1
10×1	18	8, 10, 14	5 2 1	18×1	18	6, 8, 10, 14	9 3 9
12×⅝	21	14, 16, 18, 22	3 0 0	18×1	17	6, 8, 10	10 10 0
12×¾	21	14, 16, 18, 22	3 7 6	19×1	18	6, 8, 10, 14	9 12 11
12×¾	18	10,14	4 17 6	20×1	18	6, 8, 10, 14	10 4 2
12×1	21	14, 16, 18, 22	4 15 0	20×1	17	6, 8, 10	11 13 4
12×1	18	8, 10, 14	6 2 6	21×1	17	6, 8, 10	12 5 0
13×1	18	7, 10, 12	6 12 9	22×1	18	6, 8, 10, 14	11 4 7
14×⅝	21	14, 16, 18, 22	3 10 0	22×1	17	6, 8, 10	12 16 8
14×¾	21	14, 16, 18, 22	3 18 9	22×1	16	6, 8, 10	14 8 9
14×¾	18	8, 10, 14	5 13 9	23×1	18	6, 8, 10, 14	11 14 9
14×1	21	14, 16, 18, 22	5 10 0	23×1	16	6, 8, 10	15 1 10
14×1	18	8, 10, 14	7 2 11	24×1	18	6, 9, 10, 14	12 5 0
16×¾	21	14, 16, 18, 22	4 10 0	24×1	17	6, 8, 10	14 0 0
16×1	18	8, 10, 14	8 3 4	24×1	16	6, 8, 10	15 15 0
16×1	17	8, 10	9 6 8				

Extra Wide Blades.

Size ins.	Gauge.	Teeth.	Price gross £ s. d.	Size ins.	Gauge.	Teeth.	Price gross £ s. d.	Size ins.	Gauge.	Teeth	Price gross £ s. d.
12×1¼	18	6, 8, 10	7 17 6	17×1½	17	6, 8, 10	16 2 4	22×1½	17	6, 8, 10	20 17 1
13×1¼	18	,,	8 10 7	18×1¼	16	,,	15 18 9	22×1½	16	,,	22 18 4
14×1¼	18	,,	9 3 9	18×1¼	17	,,	14 8 9	22×2	17	,,	28 12 11
14×1¼	17	,,	11 4 7	18×1½	18	,,	15 11 3	23×1½	17	,,	21 16 0
14×1½	18	,,	12 2 1	18×1½	17	,,	17 1 3	24×1¼	16	,,	21 5 0
14×1½	16	,,	14 11 8	18×1¾	17	,,	20 0 5	24×1½	17	,,	22 15 0
15×1¼	18	,,	9 16 11	19×1¼	17	,,	15 4 9	24×1½	16	,,	25 0 0
16×1¼	18	,,	10 10 0	19×1½	17	,,	18 0 3	24×2	17	,,	31 5 0
16×1¼	17	,,	12 16 8	20×1¼	17	,,	16 0 10	26×1½	16	,,	27 1 8
16×1½	18	,,	13 16 8	20×1½	17	,,	18 19 2	26×2	16	,,	37 0 0
16×1½	17	,,	15 3 4	20×1¾	16	,,	24 5 0	28×1½	16	,,	29 3 4
17×1¼	18	,,	11 3 1	20×2	17	,,	26 0 10	28×2	16	,,	40 0 0
17×1¼	17	,,	13 12 8	21×1¼	18	,,	13 15 7	30×1½	16	,,	31 5 0
17×1½	18	,,	14 14 0	21×1½	16	,,	21 17 6	30×2	16	,,	43 0 0

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HACK SAWS.

Fig. 1628.

No. 15. Cast iron frame, black enamelled. Stained hardwood handle. Price without blade.

No.	4A	4B	4C	4D
Capacity, inches	8	9	10	12
Price each	**1/4**	**1/4**	**1/5**	**1/8**

Fig. 1630.

No. 16. A compact, stiff frame with solid back, adjustable by means of sliding end post. With one blade, capacity 6″—12″.
Price .... **5/6** each.

Fig. 1632.

No. 11. These frames are made extra heavy for work on rails, girders, etc. Blades are strained by turning handle and are faceable in four directions. Knurled check nut holds blade in place. Polished, with stained hardwood handle. Capacity 12″.
Price, with one blade .... **7**/– each.

Fig. 1634. Constructed to enable to "cut in" at inaccessible places. Very handy. Cuts up to 1″ diameter.
Price with one 8″ blade .... **4**/– each.

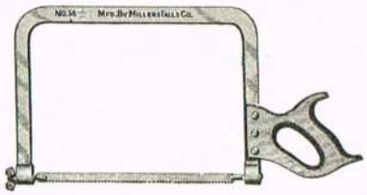

Fig. 1636.

No. 14. Deep, heavy frames for sawing steel rails, girders and other large work. Handle of beech wood, shaped to give firm, comfortable grip. Nickle plated frame. Capacity 8″—12″.
Price, with one blade, ... **10**/– each.

Fig. 1629

Nickel plated **Adjustable Hack Saw**, with polished hardwood handle.

Nickel plated price	**4/2** each
Bright price	**3/6** each

Fig. 1631.

No. 10. Unusually rigid back. Adjustment easily made by set screw. End opposite handle built close, permitting operation in close corners. Check nut keeps blade from falling off if turned at right angle. Blades strained by handle and faceable in four directions. Scale for different lengths on back of frame. Polished and nickel plated. Cocobolo handle. One 10″ blade with each frame. Capacity 8″—12″.
Price with one blade .... **5/6** each.

Fig. 1633.

No. 12. The handle on this frame and adjustable are made in one. Special black composition handles are screwed on either side. Blades strained by thumb nut and faceable in four directions. Polished and nickel plated frame. Capacity 8″—12″.
Price with one blade .... **7/6** each.

Fig. 1635. Toolmakers' Hack Saw Frame, fitted with ⅜″ wide blades. Very useful for die-makers.
Price, with 1 dozen blades .... **7**/– each.

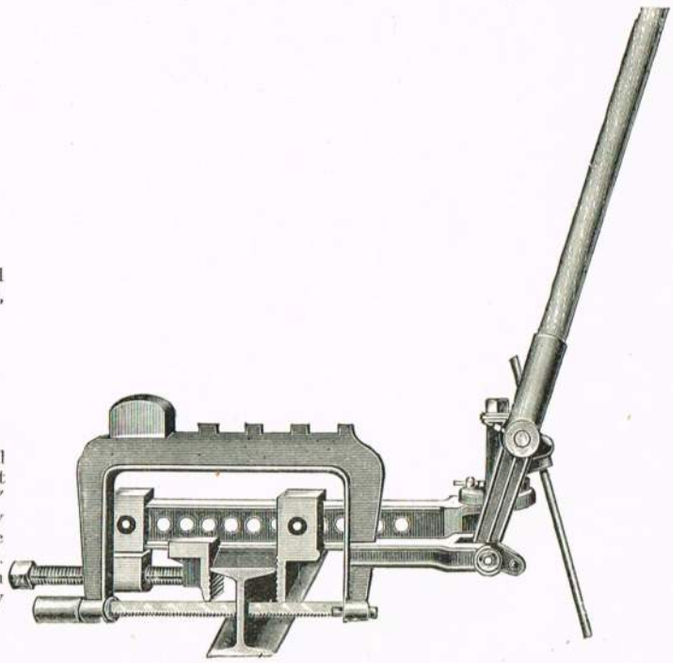

Fig. 1637. Rail and Girder Saw, for Hand Power.

This machine is designed to meet the demand for a powerful and efficient machine to take on the job when it is not convenient to bring the material to be cut to the workshop. It takes 14″ power hack-saw blades, and will cut 9″ at first setting. Specially suited for constructional engineers, railways, tramways, and large engineering works. It cuts accurately and no trimming is required. The blades last long owing to the rigidity of the blade when in position. The weight is only 90 lbs. and compares favourably with the speed of the action of a power machine.
Price .... **£7 10 0.**

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SHEARING MACHINES.

This is a tool combining great strength with extreme lightness. Sheets of all sizes can be cut completely through, without distortion, uniformly and easily.

By means of the Adapter, shown in the top illustration, the tool can be instantly converted from a portable tool to a fixed bench tool by simply dropping it into the Adapter. In this case the guide handle is unscrewed.

The lower illustration shows clearly the manner of operation as a portable tool. The thinner sheets can be easily cut in this way.

When required to make a partial cut, as in corner work, etc., the sheet can be instantly released and withdrawn, by simply pulling over the eccentric adjustment screw as indicated in dotted lines at B in Fig. 1.

Before commencing to cut see that the screw is returned fully to locked position as at A. or C.

When cutting sheet 3/32″ to 1/8″ the adjustment screw should be moved to position C., Fig 1, and screwed down so that the end of the screw engages in the recess to lock the parts. This brings the cutters slightly apart and renders the operation considerably easier and also avoids distortion of the sheet.

Adjustment of the lower cutters can be effected by simply turning the nut D., Fig 2, which will move the cutter against the spring E. The parts are then locked by tightening the lock-nut F.

When worn the cutters may be removed and re-ground, and adjusted to proper position again.

When cutting large sheets see that the sheet is supported level with the cutting point. This will avoid damage or chipping of the cutters due to strains set up by the weight of an overhanging sheet.

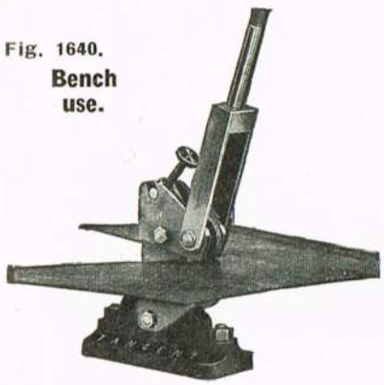

Fig. 1640. Bench use.

Fig. 1640. Type H.P.C.

Capacity 3/32. Steel. Weight 8lbs.

Price £5 5 0 each.

Spare parts:

Top Cutter, **15/-**; Bottom Cutter, **12/6**

Driving Ratchet, **4/6**; Driven Ratchet, **5/6**.

Fig. 1640A. Portable use.

Fig. 1641. Type C.C.A.

Price, **£4/4/0**.

CORRUGATED IRON CUTTERS.

Types C.C.A. (Fig. 1641), and C.C.B. (Fig. 1642).

Capacity up to 20 gauge. Weight 5 lbs. — Capacity up to 18 gauge. Weight 6½ lbs.

Self-feeding. Non-distorting. Portable. Cuts curved, straight or obliquely.

Tangent Tools, light enough almost to be carried in the pocket, will cut corrugated iron quickly, either straight, on a curve, or obliquely across the sheet without distortion of the cut edges. Very little power is required, and once the cut is started, the feed or relative movement between the tool and the sheet is quite automatic.

The tool comprises a pair of rotary double-edged cutters, serrated or knurled round the shearing edges. The upper cutter is driven by means of an internal ratchet by operating the forked handle backwards and forwards.

The driven cutter may be adjusted relatively to the lower free cutter by means of the adjustment screw. Before commencing a cut, adjust the driven cutter so that it just enters between the edges of the lower or free cutter. Should slipping occur and the tool fail to feed continuously, screw down the adjustment screw until the cutters grip the feed strip firmly.

The tool may be withdrawn from the sheet at any point by simply unscrewing the adjusting screw, thereby moving the cutters apart. This feature enables the tool to be used for cutting out corners or angular pieces from a sheet.

It is most important when cutting that the tool be allowed to incline to the corrugations. This ensures clean shearing and no slipping; it also prevents distortion.

The C.C.B. type tool is similar to C.C.A., but has compound leverage giving much greater power, and making it considerably easier to cut heavier gauges.

It is recommended only for cases where a considerable quantity of sheets above 20 gauge have to be cut up, as the increased leverage obviously results in a slower cutting speed.

In cases such as corner work where the tool has to be withdrawn from the sheet after a partial cut, it is advisable to make a chisel cut previously (about the same width as the feed strip) at that point where the cut is to terminate.

This allows the tool together with the feed strip to be quickly and easily removed.

The manipulation and adjustment of both types of tool are similar in all respects, and both possess the same universal features.

Spare parts for **Figs. 1641** and **1642**: Top Cutter, **12/-**; Bottom Cutter, **14/-**; Driving Ratchet, **4/-**; Driven Ratchet, **3/6**.

Full particulars of power machine on application.

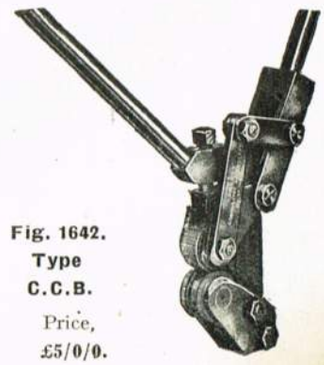

Fig. 1642. Type C.C.B.

Price, **£5/0/0.**

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SHEARING MACHINES.

Illustration shewing machine in use.

Fig. 1643. Type B.C.H.

Setting.—To facilitate correct setting of the machine a setting gauge is supplied, the ends of which are marked $^3/_{16}''$ and $\frac{1}{4}''$ respectively.

The diagram illustrates the method of using it, which is simply the insertion of the end gauge, corresponding to the thickness of the sheet to be cut, between the cutters, and then lowering the upper cutter by means of the adjustment handle (at side) until both cutters are in light contact with the gauge. The upper cutter is then locked by means of the rear handle and the machine ready for use. When setting see that gauge is set horizontally.

For very thin sheets the cutters should be slightly overlapping, whilst for sheets $^1/_{16}''$ and $^3/_{32}''$ they should be about level with each other.

Release.—If it is desired to release the sheet when partially cut across, the parts are unlocked by means of the rear handle, whereupon the upper cutter may be moved upwards to its fullest extent, which permits of the sheet being withdrawn.

Lateral Adjustment of Lower Cutter.—This can be effected by manipulation of the nuts on the spindle end in a similar manner to that described with reference to type H.P.C.

Variable Leverage.—When cutting thin sheets the leverage may be conveniently reduced so as to increase the amount of rotation of the driven cutter at each stroke of the operating handle, whereby the machine is rendered quicker in action. To affect this alteration of leverage the clamping nut between the outer ends of the links is slightly unscrewed, which will allow of the pin upon which it is mounted being moved to the bottom of the slot. The nut is then tightened.

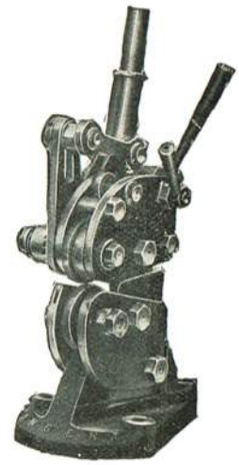

Fig. 1643. Type B.C.H.

NOTE.—When trimming sheets by shearing off narrow strips, the sheet should always be at the left-hand side of the machine.

Large Sheets must always be well supported so that the weight of the sheet does not strain the cutters.

Capacity up to $^3/_{16}''$ in steel, and $\frac{1}{4}''$ in iron, etc. Weight, 55 lbs.

Space occupied, $11\frac{1}{2}''$ by $7''$.

CUTTING SPEED.

With greatest leverage (56 to 1), for sheets $\frac{1}{8}''$ and $^3/_{16}''$, about 2′ 6″ per minute.

With lesser leverage (36 to 1), for thinner sheets, about 4′ 6″ per minute.

This machine has no throat, is self-feeding, and is in no way restricted to length or width of sheet.

The driving ratchets are placed outside the driven cutter, the drive being taken through a hexagon shaft.

The driven cutter may be adjusted in any desired position in regard to the lower free cutter (within limits) by simply moving the adjustment handle provided at the side of the machine. Locking is effected by means of the handle at the rear of the machine.

The cutters may thus be set only sufficiently close together as to ensure shearing which prevents undue distortion of the sheet, and consequently less power is required to work the machine. $^3/_{16}''$ sheets can be cut with one hand.

Type B.C.H. £10 0 0 each.

SPARES.—Top cutter, **30/-**. Bottom cutter, **35/-**. Driving ratchet, **12/6**.

Driven ratchet, **10/-**.

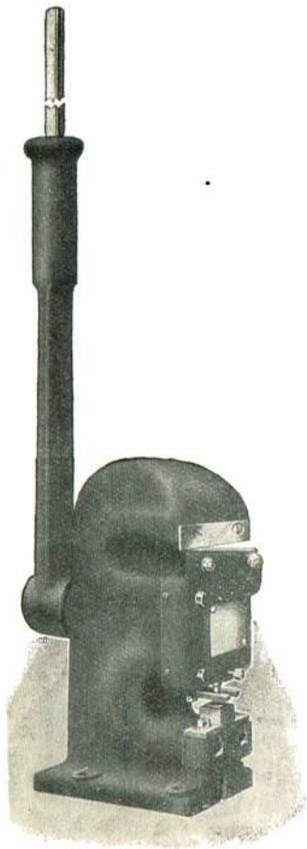

Fig. 1644. LEVER PUNCHING AND SHEARING MACHINE.

New and improved design, operated by long powerful lever, and will do the work specified with ease. Constructed of cast-iron and the cutters of best steel. Shears set at an angle for cutting off long bars. Prices include one punch and die and one pair of shear blades.

Size	To punch	Through	Shear	Depth of gaps	Approx. weight	Price	Extra punches and dies. Round	Square	Extra shear blades
10	$\frac{3}{8}''$	$\frac{1}{4}''$	$\frac{1}{4}''$	4″	$1\frac{1}{2}$ cwt.	**£10 0 0**	**16/-**	**20/-**	**20/-**
11	$\frac{1}{2}''$	$^5/_{16}''$	$^5/_{16}''$	4″	$2\frac{1}{2}$ cwt.	**£15 0 0**	**16/-**	**20/-**	**20/-**
12	$\frac{5}{8}''$	$\frac{3}{8}''$	$\frac{3}{8}''$	6″	4 cwts.	**£25 0 0**	**16/-**	**20/-**	**25/-**

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SHEARING MACHINES.

Fig. 1646. Type C.S.

For cutting flat sheets. Will cut curves in flat sheets in any direction, and to any dimensions from $2\frac{1}{4}$in. radius upwards. Self-feeding, continuous cutting, No. 1 capacity up to 16 S.W.G. Weight 16lbs. and No. 2 with shear sheets 20 up to 14 gauge.

The rotary cutters must be brought together so as to just overlap. This operation is performed by moving handle A. When in this position they should be locked fast by lock-nut provided for this purpose. The sheet to be cut should be held horizontally, when the tool will follow a line in any direction by simply guiding the sheet by hand.

The cut can be stopped at any point on a line, and the sheet removed from the tool by separating the cutters. This feature will be found most useful in complicated corner work, etc.

The ideal hand tool for Motor Body Builders, manufacturers of Laggings for steam pipes, boilers, etc., and Sheet-metal Workers generally.

No. 1 or No. 2 machine ... Price, **£6 5s. 0d.**

Spare Parts: Top Cutter, **15/-**; Bottom Cutter, **12/6**; Driving Ratchet, **4/6**; Driven Ratchet, **5/6.**

Fig. 1647. Type R.S. ROD SHEARING MACHINE OF GREAT STRENGTH.

Independent Dies. Round or Square. Clean Cutting. Easy Operation. Weight, 17lbs. Capacity up to 7/16 in.

This Shearing Machine will be found of great utility for cutting off round or square rods; especially so in such cases as in Ferro-Concrete work, etc., where quantities of a given length are required.

The Shearing is effected by means of a pair of hardened and tempered circular dies, one of which is fixed in the frame, the other being carried by the movable arm of the machine. The opposing faces are ground, and are kept in contact by a hardened and ground central pin, which also serves as the fulcrum.

The Dies each have four slightly tapered holes of different sizes, to suit different sizes of stock, and if care is taken to see that the work is inserted in a hole most nearly approaching the size of the stock, a clean, square and undistorted shear is obtained.

The dies are quickly removed for regrinding or replacement.

Price £4 0 0. Extra Dies, 30/- each.

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SHEARING & PUNCHING MACHINES.

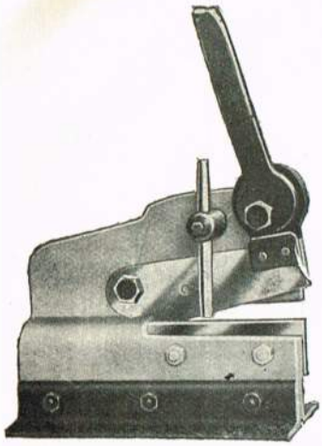

Fig. 1648. Nos. CA401 to CA403.

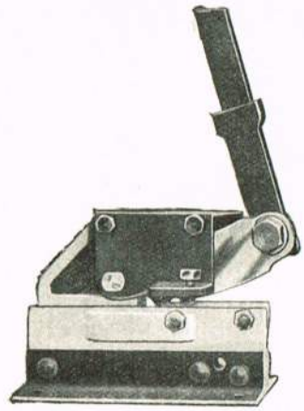

Fig. 1649. Nos. CA691.

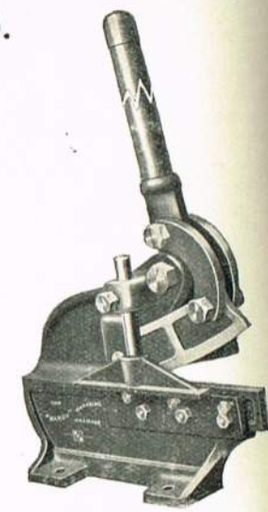

Fig. 1650. Nos. CA501 to CA503.

LEVER PLATE SHEARS.

Machine Nos.	CA401	CA402	CA403	CA501	CA502	CA503	CA601
Will cut: Iron plates up to inches	5/32	7/32	9/32	3/16	1/4	5/16	1/8
Flat iron bars up to inches	7/32	9/32	3/8	1/4	5/16	3/8	5/32
Round iron bars up to inches	13/32	15/32	1/2	5/16	3/8	7/16	1/4
Length of blades inches	4½	6	8	4¾	6½	8¼	3
Approx. weight lbs.	14	36	56	22	48	61	12
Price each	**32/–**	**62/–**	**80/–**	**90/–**	**135/–**	**180/–**	**45/–**

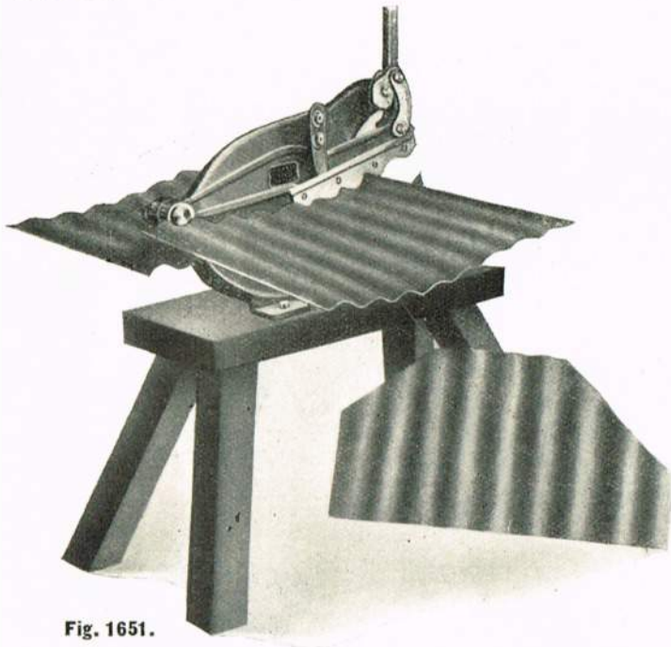

Fig. 1651.

Fig, 1651. FATENT LEVER CORRUGATED IRON SHEARING MACHINES. Made of Steel.

This machine will cut across corrugated iron sheets of unlimited width and length perfectly straight and smooth. It will also make a splay cut as shown in above illustration. The waved cutters are made with the greatest accuracy to ensure an easy and smooth cut without spoiling the corrugations in the least. The waved cutters supplied with this machine will do bevel or splay cutting up to 67°. For bevels from 67° to 45° a special pair of corrugated cutters is required for which we charge **£2 10s.** extra.

The price of a complete machine with one pair of waved cutters for 3″ corrugations (without wooden stand is

Price ... **£13 2 6.**

Nett weight 1 cwt.

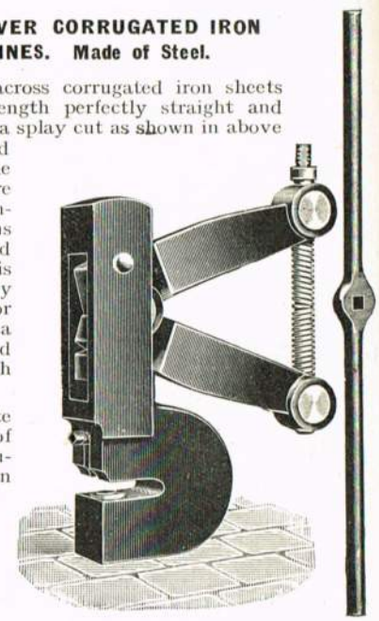

Fig. 1652.

Fig, 1652. DUPLEX PUNCHING BEARS.

Body forged of one solid piece of steel.

Nos.	AB601	AB602	AB603	AB604	AB605
To punch up to inches	½ × 5/16	13/16 × ⅜	¾ × ⅝	⅞ × ⅝	1 × 11/16
Largest diameter hole inches	11/16	13/16	1	1⅛	1⅛
Depth of gap inches...	1⅜	2	2⅜	2¾	2 13/16
Approx. weight lbs. ...	22	44	101	143	187
Price each	**55/–**	**100/–**	**170/–**	**270/–**	**330/–**

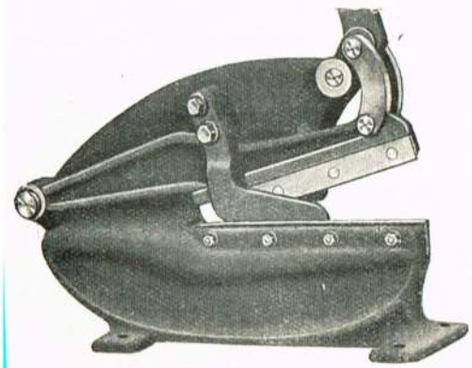

Fig. 1653. Nos. CA1001 to CA1003.

Fig. 1653. LEVER PLATE SHEARING MACHINE.

No.	CA1001	CA1002	CA1003
Cut iron plate any width; thickness inches	3/32	3/16	¼
Flat iron bars inches	3/16	¼	5/16
Length of blades inches	15¾	13¾	9¾
Approximate weight lbs.	88	127	165
Price each	**£14 0 0**	**£16 0 0**	**£20 10 0**

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PUNCHING AND SHEARING MACHINES.

Fig. 1654. HANDY PUNCHING BEARS.

For punching round holes only. Lever supplied with each machine. A shoe for fixing 2, 2a, 3 and 4 to bench, supplied at an extra charge of **15**/- each. These machines are made from cast steel, with mild steel screws, one round steel punch and die. All parts are interchangeable. Strippers supplied at a small charge for punching out rivets.

Size.	Punch—inches.		Depth of gap from centre Punch. inches.	Weight. lbs.	Price complete.	Extra Punches.	Dies.
B1	$\frac{1}{8}$ to $\frac{1}{2}$	$\frac{1}{8}$ to $\frac{1}{4}$ through $\frac{1}{4}$ iron plate $\frac{3}{8}$,, $\frac{3}{16}$,, $\frac{1}{2}$,, $\frac{3}{32}$,,	1	4	**£2 7 0**	**3/-** Interchangeable	**5/-**
B1	$\frac{1}{4}$ to $\frac{1}{2}$	$\frac{1}{8}$ to $\frac{5}{16}$,, $\frac{1}{4}$,, $\frac{3}{8}$,, $\frac{3}{16}$,, $\frac{1}{2}$,, $\frac{1}{8}$,,	$1\frac{3}{4}$	$7\frac{1}{2}$	**£3 0 0**		
B2	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{1}{2}$,, $\frac{1}{2}$,, $\frac{3}{8}$,, $\frac{3}{8}$,, $\frac{3}{4}$,, $\frac{1}{4}$,,	$1\frac{1}{2}$	$22\frac{1}{2}$	**£4 10 0**	**4/6** Interchangeable	**7/6**
B2a	$\frac{1}{8}$ to $\frac{3}{4}$ round and shaped holes	$\frac{1}{2}$,, $\frac{1}{4}$,, $\frac{3}{8}$,, $\frac{3}{16}$,, $\frac{3}{4}$,, $\frac{1}{8}$,,	$2\frac{1}{2}$	20	**£4 10 0**		
B3	$\frac{1}{8}$ to $\frac{3}{4}$ round and shaped holes	$\frac{1}{2}$,, $\frac{1}{4}$,, $\frac{3}{8}$,, $\frac{3}{16}$,, $\frac{3}{4}$,, $\frac{1}{8}$,,	$2\frac{1}{2}$	20	**£5 5 0**	Round **4/6** Square	**7/6**
B4	$\frac{1}{8}$ to $\frac{3}{4}$ round and shaped holes	$\frac{1}{2}$,, $\frac{1}{2}$,, $\frac{3}{8}$,, $\frac{3}{8}$,, $\frac{3}{4}$,, $\frac{1}{4}$,,	$1\frac{1}{2}$	$22\frac{1}{2}$	**£5 5 0**	**9/9** Interchangeable	**11/6**

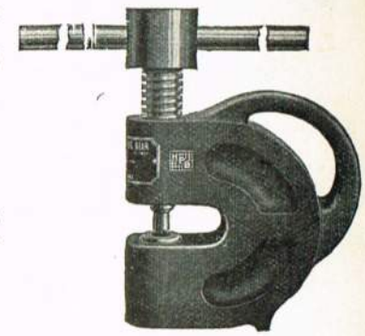
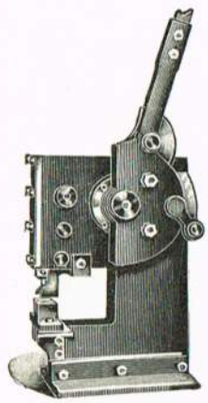


Fig. 1655.

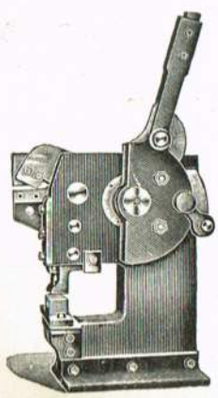


Lever Punching Machines. Frames are of wrought mild steel. A deep gap is provided. The ram is solid. Fitted with adjustable gauge. Nos. BB101 to BB104 are multiple lever single action, Nos. BB105 multiple lever, triple action, Nos. BB106 and BB107 multiple lever rachet and pawl action.

Standard Sizes. Machine No. ...	BB101	BB102	BB103	BB104	BB105	BB106	BB107
Punching Capacity—							
To punch holes up to ... ... in.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	1
Through Iron Plate ... ... in.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Largest dia. hole ... ... in.	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{3}{16}$	$1\frac{3}{8}$
With Special Die Holder.							
Largest dia. hole ... ... in.	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$
Depth of gap ... ... in.	3	$4\frac{5}{8}$	$5\frac{7}{8}$	$6\frac{1}{4}$	$7\frac{1}{8}$	$8\frac{1}{2}$	11
Approximate weight ... ... lbs.	33	70	132	187	330	551	880
Price ... ... each	**£4**	**£7**	**£12**	**£15**	**£25**	**£38**	**£60**

These machines can be supplied with larger gaps to meet requirements.

Fig. 1656.



Lever Punching and Bar Shearing Machines. Constructed same as BB1 machines, but made shear bars. Nos. BC101 to BC104 are multiple lever single action, No. BC105 multiple lever triple action, No. BC106 and BC107 multiple lever and rachet and pawl action.

Standard Sizes. Machine Nos. ...	BC101	BC102	BC103	BC104	BC105	BC106	BC107
Punching Capacity—							
To punch holes up to ... ... in.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	1
Through Iron Plate ... ... in.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Largest dia. hole ... ... in.	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{3}{16}$	$1\frac{3}{8}$
With Special Die Holder.							
Largest dia. hole ... ... in.	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$
Depth at gap ... ... in.	3	$4\frac{5}{8}$	$5\frac{7}{8}$	$6\frac{1}{4}$	$7\frac{1}{8}$	$8\frac{1}{2}$	11
Bar Shears will cut—							
— Iron bars ... ... in.	$\frac{7}{32}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{15}{32}$	$\frac{1}{2}$	$\frac{5}{8}$	$2\frac{5}{32}$
● and ◆ Iron bars ... ... in.	$\frac{3}{8}$	$\frac{15}{32}$	$\frac{17}{32}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{15}{16}$	$1\frac{3}{16}$
L and **T** Iron bars in 2 and 3 cuts ... ... in.	$1\frac{9}{16} \times \frac{5}{32}$	$1\frac{15}{16} \times \frac{3}{16}$	$2\frac{1}{8} \times \frac{5}{16}$	$2\frac{3}{8} \times \frac{5}{16}$	$2\frac{3}{8} \times \frac{3}{8}$	$2\frac{3}{4} \times \frac{15}{32}$	$3\frac{1}{2} \times \frac{19}{32}$
Length of Blades ... ... in.	2	$2\frac{3}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$3\frac{15}{16}$	$4\frac{3}{4}$
Approximate Weight ... ... lbs.	36	77	154	210	342	606	904
Price ... ... each	**£5 10s.**	**£9**	**£15**	**£18**	**£29**	**£45**	**£68**

These machines can be supplied with larger gaps to meet requirements.

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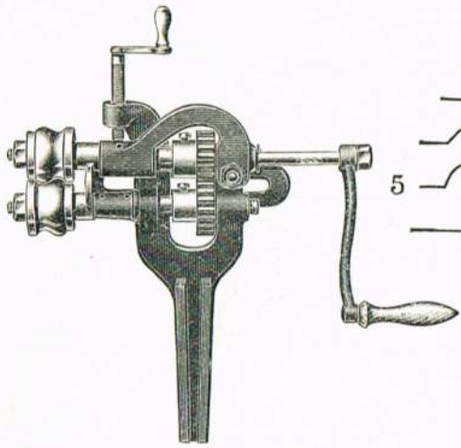
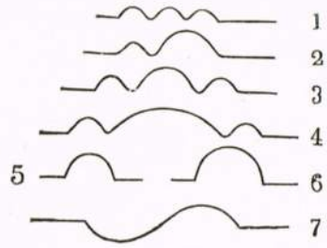


Fig. 1660. Size 1.



Diagrams showing various rollers supplied with these machines.

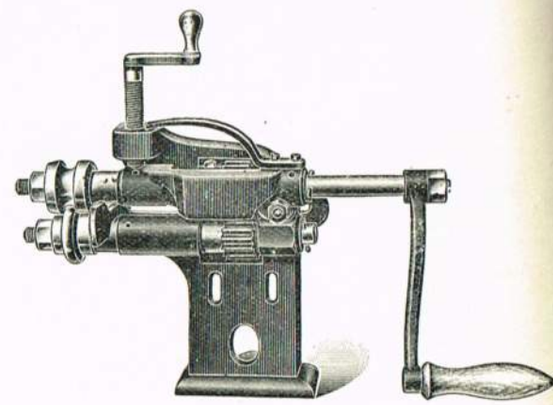


Fig. 1661. Size 2.

Fig. 1660/2. Beading or Swaging Machines for Tin.

These Beading Machines are used for ornamenting and strengthening Tin and Ironplate Goods. They do the work far superior and in less time than can be done by the common hand-swage. The Rollers are easily changed from one pair to another. By sending a sketch or patterns, Rollers can be made to fit without sending the Machines.

When ordering a Machine customers should say what patterns, or send a sketch, *full size and proper shape*, of any particular pattern. Each Machine is complete with one pair of Rolls. Special designs made to order, price according to size and shape desired.

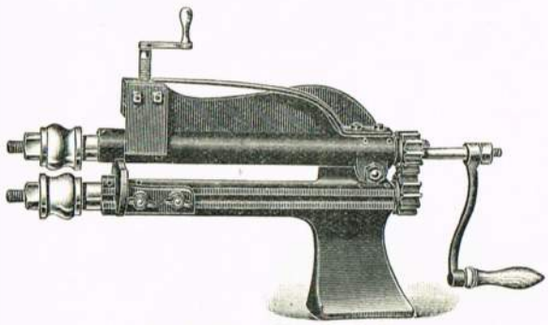


Fig. 1662. Size 3, 4, 5.

Size.	Reach.	Approximate Weight. Cwts. Qrs. Lbs.		Extra rolls per pair.
1	2½″	21	£3 10 0	14/–
2	4″	1 10	£5 16 0	14/–
3	12″	2 24	£8 0 0	20/–
4	15″	3 14	£12 0 0	20/–
5	18″	1 2 0	£16 0 0	24/–

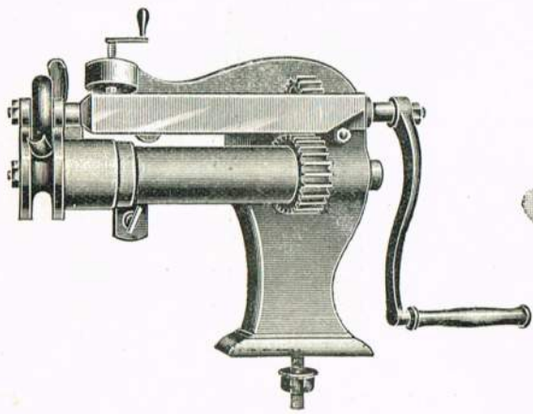


Fig. 1663.

Bath Beading Machine. Size 1.

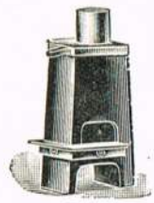
Bath Beading Machine complete with 1 Pair of Rollers and Curver for Forming and Curving at same time, to any diameter, 1¼″ Beads, or Moulds for Baths, &c.

Extra Rollers and Curvers for other sizes of Beads supplied.

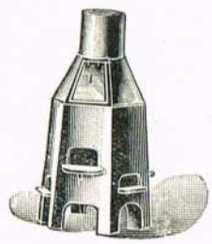
This Machine can be geared for larger Beads if required.

Size 1. Price **£7 10 0.**

Extra Rollers and Curves **35**/– per set.



No. 1.
Fig. 1664.



No. 2.
Fig. 1665.

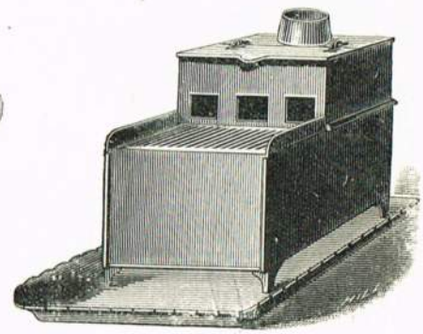


Fig. 1666.

Tinmen's Stoves for Coal or Coke. Cast Iron Body.

Fig. 1664.	No. 1.	Price **33**/- each.
Fig. 1665.	No. 2.	Price **37**/**6** each.
Fig. 1666.	No. 3.	Price **46**/- each.

Fig. 1667. Special Pattern Sheet Iron Charcoal Stove.

With Soldering Iron Rest and Wire Handle. Made of 19 gauge Sheet Iron. Diameter at foot, 7″. Height, 16″. Price **9**/– each.

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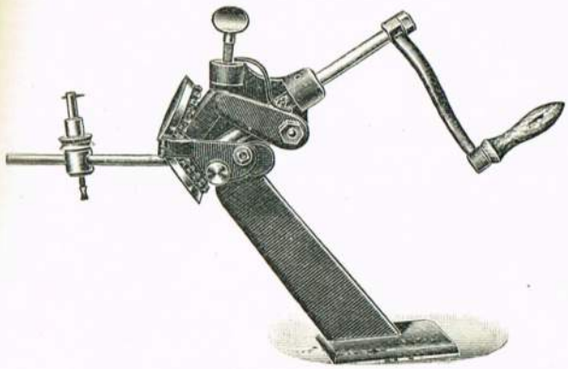

Fig. 1668. Paning Down Machine.

Which follows the burring machine. After the bottom is put on the body, nip the edge and run the can round to close the edge, then run a second time to partially bend the edge up ready for the closing machine or mallet.

Size 1.	Weight 24 lbs.	Price **95**/- each.
Size 2.	Weight 30 lbs.	Price **120**/- each.

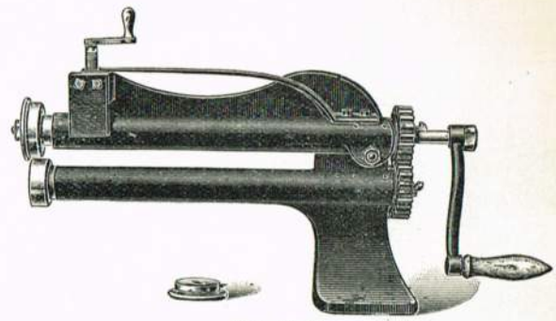

Fig. 1669.

After the Paning Machine has Paned the bottom seam and partially bent it up, this Machine lays the bottom edge against the can side, which completes the process called "Knocking up or Closing."

It is also used to put the Bottoms on Coffee Canisters, &c., without soldering, when specially ordered for that sort of work.

Nos. 1, 1½ and 2 Machines are complete with 1 Bottom and 2 Top Rollers.

Size.	Reach.	Diam. of Bottom Roll.	Weight Qrs.	Weight Lbs.	Price each.
1	10″	2¼″	1	20	**£5 10 0**
1½	12″	2¼″	2	0	**£7 0 0**
2	15″	3″	2	21	**£8 10 0**
1A	6″	1¾″	.....		**£5 10 0**
1B	8″	1¾″	.....		**£7 0 0**

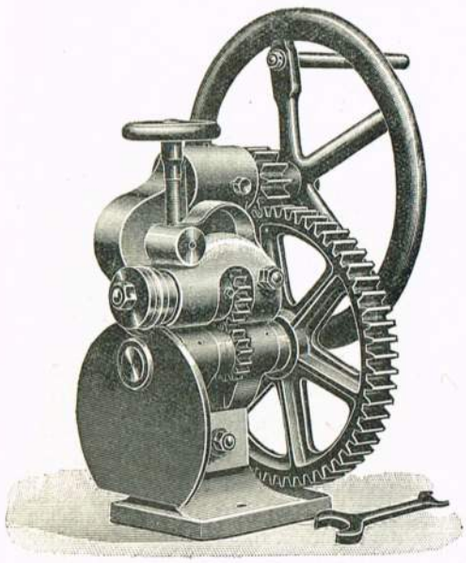

Fig. 1670. Strong Beading or Swaging Machine.

This illustration represents a Machine fitted with Gearing to gain power, and arranged to work by hand. When required, it can for a small extra cost, be fitted with Fast and Loose Pulleys, so as to be driven by Power.

This Machine can be used for corrugating on the top and bottom of Kegs, &c.

Hand Machine ...	Price	**£30 0 0.**
Hand or power machine	,,	**£33 0 0.**
With stand to floor extra	,,	**£5 0 0.**

Can also be fitted with treadle.

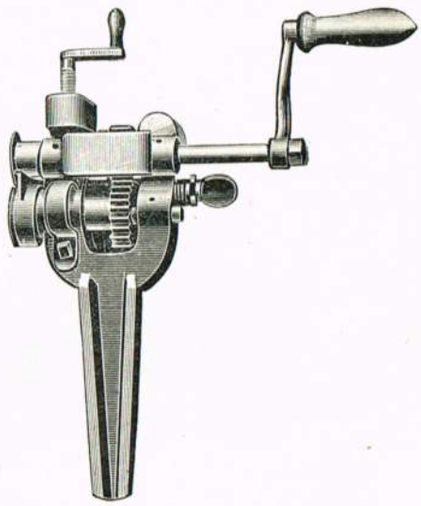

Fig. 1671. Burring Machine or Jenny.

These Machines are used to edge bottoms and bodies, round and oval, crease and edge covers, funnels, &c., put in wires, and do many other sorts of work in the best style of workmanship.

No.	Dia. of Top Roll. Ins	Weight. Lbs.	Price each.
1—Small Size ...	1½	14	**£3 5 0**
2—Regular Size ...	2	21	**£3 5 0**
2a— ...	2¾	37	**£7 0 0**
3—For Iron Work.	3½	53	**£9 0 0**

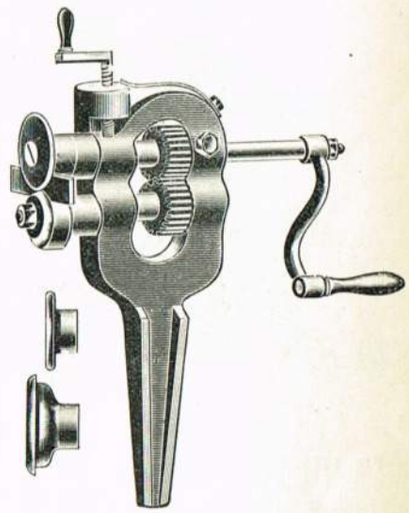

Fig. 1672. Turning-up or Wiring Machines.

These are worked in the same way as the Burring Machine. To turn up the edges use a pair of Rollers suitable for the wire you intend to put in. When you have edged a quantity of work change the top roller for a closing roller and lay the tin round the wire. Each Machine is complete with four pairs of wiring and only two closing rollers.

No.	Weight Lbs.	Capacity Dia. of Ins. Wire.	Price each.
1— ...	24	$\frac{1}{8}$—$\frac{5}{16}$	**£7 0 0**
2—Strong ...	50	$\frac{3}{16}$—$\frac{3}{8}$	**£9 0 0**
3—Strong .	84	$\frac{5}{16}$—$\frac{9}{16}$	**£14 14 0**

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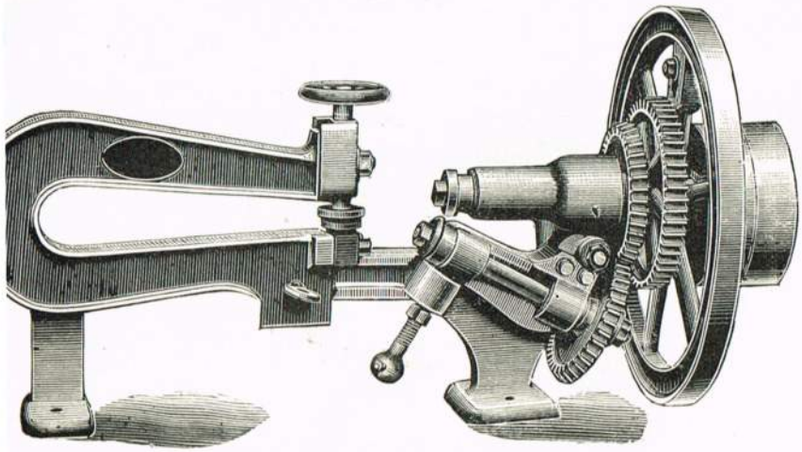

Fig. 1673.

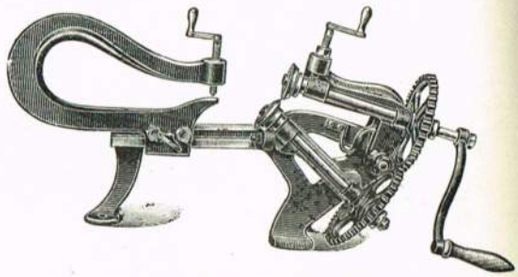

Fig. 1674. CIRCLE CUTTING MACHINE.

Small illustration represents Sizes 1 and 2, and can be fitted with Pallets or Clam Plates in place of the centre for holding sheets whilst being cut for **35/-** extra. By this plan the hole made by the centre in the sheet is avoided. Each machine complete with one pair cutters. Large illustration represents Sizes 3, 4, 5, 6 and 7.

Size.	Will cut Circles. Diam.	Thick.	Approx. weight. cwt. qrs. lbs.	Price. Hand.	Price. Power.	Extra Cutters per pair.
1	2½—14 ins.	22 W.G.	0 0 42	**£5 10 0**	—	**15/-**
2	3—18 ins.	20 W.G.	0 0 70	**£9 0 0**	—	**21/-**
3	5—36 ins.	16 W.C.	2 1 14	**£20 0 0**	**£24 0 0**	**28/-**
4	5—36 ins.	⅛ in. plate	4 1 0	**£26 0 0**	**£29 8 0**	**28/-**
6	6—40 ins.	⅛ in. plate	8 1 0	—	**£56 0 0**	**40/-**
7	6—48 ins.	⅛ in. plate	8 2 0	—	**£70 0 0**	**40/-**

Fig. 1675. Guillotine Squaring Shears.

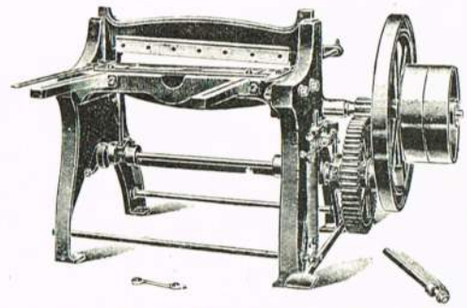

Fig. 1676. Improved Guillotine Squaring Shears.

Fig. 1675. Guillotine Squaring Shears, for cutting tin and other sheet metal. This machine is easily worked by foot power, enabling both hands to be set free for handling sheets. Fitted with quick set back and front gauges for squaring, trimming, etc., any angle required without marking the sheet. Of heavy construction. Will not draw the sheets. A man can work quicker with this machine than any other shears. Also arranged for cutting narrow strips.

Size	1	2	3	4	5	6	7	
Length of Knives	20⅜	24⅜	30½	36½	40½	42½	48½	inches.
Approximate weight	278	343	532	616	644	672	784	lbs.
Price	**£14 14 0**	**£16 0 0**	**£19 0 0**	**£23 0 0**	**£29 0 0**	**£35 0 0**	**£40 0 0**	each.
Extra Blades, per pair	**£3 0 0**	**£3 12 0**	**£4 10 0**	**£5 8 0**	**£6 0 0**	**£6 6 0**	**£7 4 0**	
Will cut up to	22	22	20	20	20	20	20	B.W.G.

Fig. 1676. Improved Guillotine Squaring Shears for hand or power, and can be fitted for cutting corrugated sheets. The above illustration represents the 30½ inch machine. Fitted with Improved Safety Clutch. Suitable for cutting, squaring, trimming sheets up to $\frac{1}{16}$in. thick. Back, front and side gauges are provided which can be set instantly without previously marking the sheet. Each machine is priced complete with one pair shears. Can be fitted with gaps or open brackets, for trimming edge of sheets of greater length than the machine.

Size	1	2	3	4	5	6	7	
Length of Knives	24⅜	30½	36½	40½	42½	48½	54½	inches.
Approximate weight	5¼	9¼	10¼	11¼	12	13½	15	cwts.
Price, Hand	**£41 0 0**	**£47 0 0**	**£53 0 0**	**£57 0 0**	**£61 0 0**	**£66 0 0**	**£78 0 0**	
Price, Power with Safety Clutch	**£54 0 0**	**£58 0 0**	**£64 0 0**	**£68 0 0**	**£72 0 0**	**£78 0 0**	**£90 0 0**	
Extra Blades, per pair	**£3 12 0**	**£4 10 0**	**£5 8 0**	**£6 0 0**	**£6 6 0**	**£7 4 0**	**£8 2 0**	

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BENDING ROLLERS.

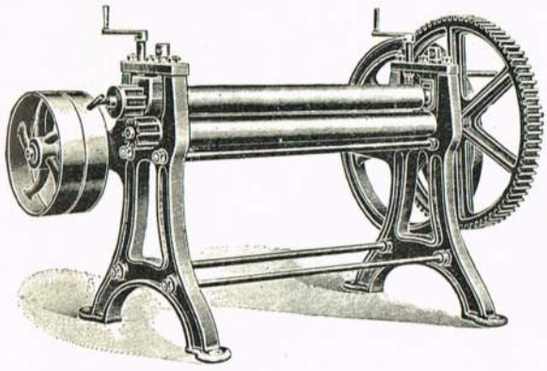

Fig. 1677. BENDING ROLLERS.

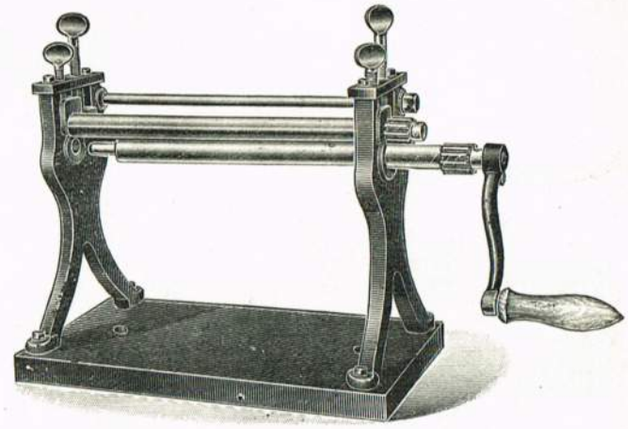

Fig. 1678. TUBE BENDING ROLLERS.

For hand or power. Will bend plates up to ⅛in. thick. With removable top roller.

Size ...	8	9	10	11
Rollers, ins.	48×4	54×4½	60×4½	66×5
Approx. weight, cwts.	18	19	20	28
Price ...	**£76**	**£90**	**£100**	**£110**

With removable top roller, allowing tubes to be withdrawn from end.

Size	V	VV	X	Y	Z
Steel rollers, ins.	10½×⅝	12×¾	12×⅞	15×1¼	18×1¼
Approx. weight, lbs.	24	28	42	77	84
Price	**£7 10 0**	**£8 0 0**	**£8 10 0**	**£10 0 0**	**£10 10 0**

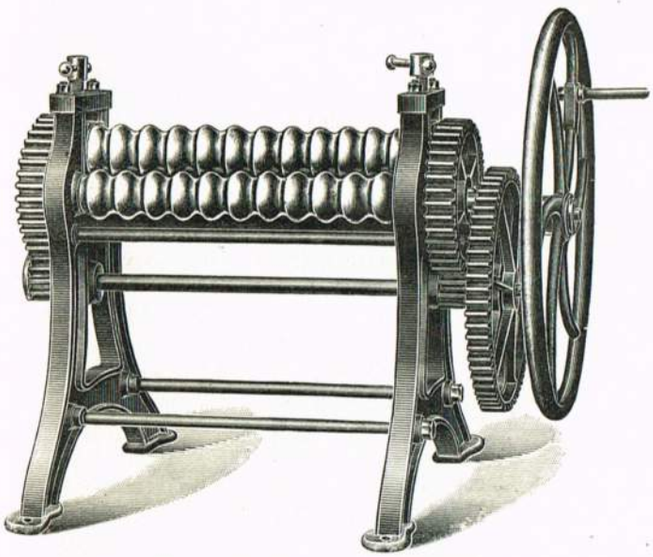

Fig. 1679. Improved Corrugated Curving Roller.

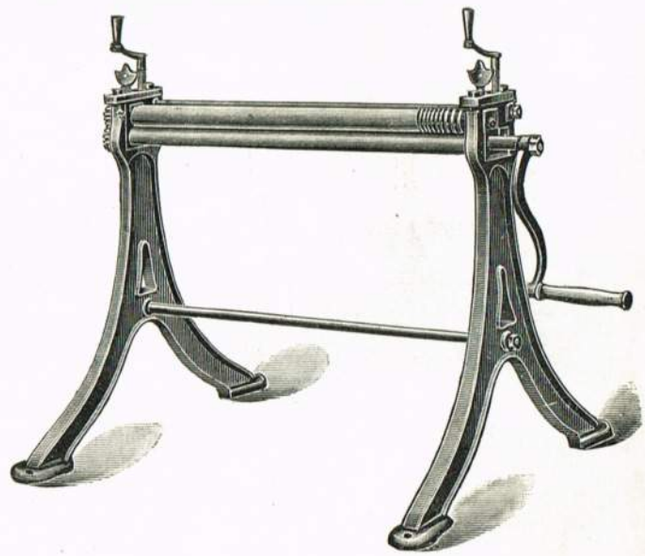

Fig. 1680. Bending Rollers.

Fig. 1679. Improved Corrugated Curving Rollers, for bending or curving corrugated iron sheet. Fitted with three rollers. Top roller arranged to raise or lower, so as to curve sheets to any radius, or the curving roller could be put in back.

Size	S	T	U
Rollers, inches...	33×5½	42×5½	50×5½
Approximate weight, cwts.	15	17½	18½
Price—Hand	**£76**	**£86**	**£100**
Price—Power	**£82**	**£90**	**£106**

Power is fitted with fast and loose pulleys.

Fig. 1680. Bending Rollers. Ordinary Pattern Hand Rollers can be supplied with flywheel and gearing.

Size	1	2	3	4	4A	4B	4C	5
Rollers, inches	25⅜×1⅜	30⅜×1¾	36⅜×2	36½×2⅜	42½×2½	42½×2⅞	49×3	56×3
Weight, lbs.	98	126	210	336	378	497	532	581
Price, with Iron Rollers	**£6 10 0**	**£8 10 0**	**£12 00**	**£17 0 0**	**£20 0 0**	**£28 0 0**	**£31 10 0**	**£34 0 0**
Price, with Steel Rollers	**£7 10 0**	**£10 0 0**	**£14 0 0**	**£19 10 0**	**£23 0 0**	**£33 12 0**	**£38 0 0**	**£40 0 0**
Extra for Draw-out Roller ...	**30/–**	**30/–**	**40/–**	**40/–**	**50/–**	**50/–**	**60/–**	**60/–**
Extra for Flywheel Bearing ...	**40/–**	**60/–**	**100/–**	**100/–**	**120/–**	**120/–**	**140/–**	**160/–**

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TINSMITHS' TOOLS.

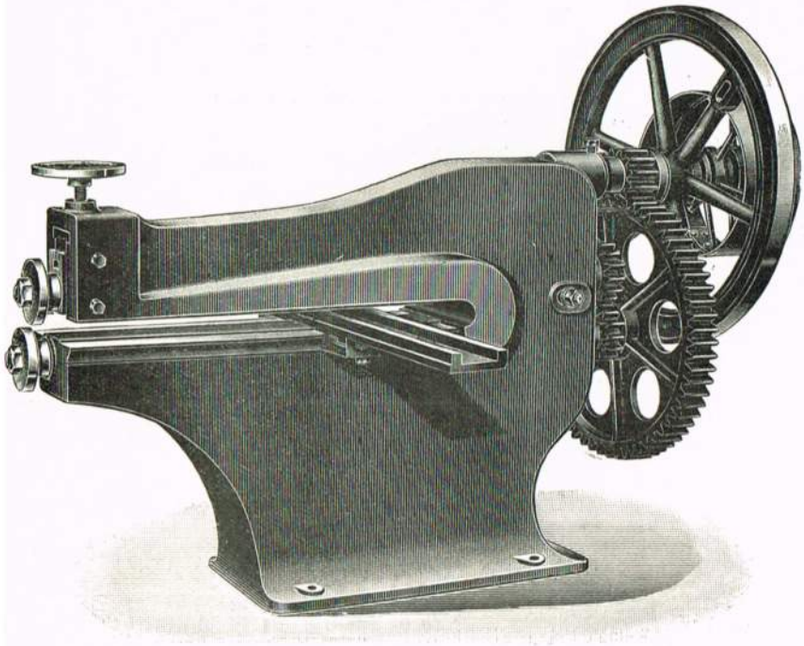

Fig. 1681. ROTARY SHEARS.

These straight cutting Circular Shears can be fitted for hand or power. Will cut efficiently sheet iron of any length: easily worked and not likely to get out of order. Fitted with long planed moveable guide which can be set at once to cut strips from 1 inch and upwards according to the size of machine. One pair of cutters supplied with each machine.

Size.	To cut strips— Breadth.	Thickness.	Approx. weight cwt.	qrs.	lbs.
A	1—12 ins.	16 W.G.	1	2	0
B	1—18 ins.	16 W.G.	3	2	0
C	1—24 ins.	⅛ in.	11	0	0
AD	1—36 ins.	⅛ in.	17	0	0
BE	1—18 ins.	¼ in.	22	2	0
F	1—24 ins.	¼ in.	28	0	0

Size.	Prices. Hand only.	Hand and Power.	Power only.	Extra Cutters each.
A	**£15 0 0**	**£18 0 0**	—	**28/–**
B	**£19 0 0**	**£22 0 0**	—	**28/–**
C	—	**£48 0 0**	—	**56/–**
AD	—	**£68 0 0**	—	**56/–**
BE	—	—	**£96 0 0**	**84/–**
F	—	—	**£110 0 0**	**84/–**

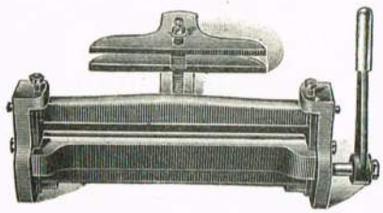

Fig. 1683.

Angle Bending Machine for tin plates. Light construction. Suitable for bending tin plates up to 24 gauge.

Size 1 will bend 12″ long. Price **120/–**
„ 2 „ 17″ „ „ **140/–**

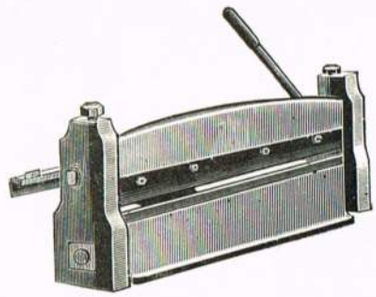

Fig. 1682.

Strong Pattern Angle Bending Machine for sheet iron or tin plates. Complete with one pair of dies and moveable gauges used for bending square and other angles, in tin or iron sheets, such as square biscuit boxes, square pipes, etc. We supply dies of various shapes for forming moulds or beads. These machines can be made with swivel beam, which will allow small square tubes to be drawn off the end without deforming.

Size	1	2	3	4	5	6
Length	20	26	30	36	42	48 inches.
Will bend...	20	19	18	18	18	16 W.G.
Approximate weight	208	252	308	392	770	924 lbs.
Price each	**£12**	**£17**	**£19**	**£24**	**£28**	**£34**
Price each, fitted with Swing Beam...	**£16**	**£21**	**£23**	**£29**	**£34**	**£40**

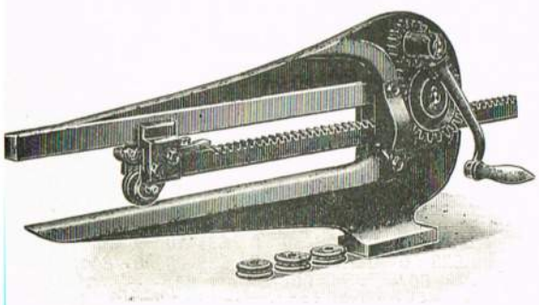

Fig. 1684. GROOVING MACHINES.

These machines are for the purpose of laying the seams together after the edges have been bent with the folding machine, either in cylinders or flat lengths. Similar machines with horns for grooving side seams of tubes, cylinders, etc., can be supplied.

Size	1	2	3	4	
Length	18	24	30	38	inches.
Approx. weights ...	1	1½	2¼	7	cwts.
Price each	**£7 15 0**	**£9 15 0**	**£12 0 0**	**£24 0 0**	

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PRESSES.

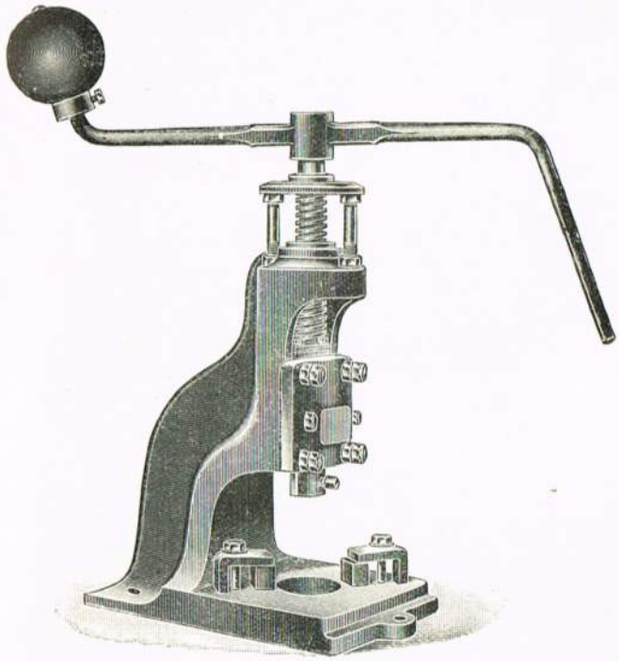

Fig. 1685. SWAN NECK SCREW OR FLY PRESS.

Illustration represents the press fitted with stop motion. Sizes 3, 3A and 4 are supplied with ball at each end. Dies can be supplied if desired ; also fitted with Stand to floor.

Size.	Diam. of Screw. inches.	Hole in Bed. inches.	From back to centre of Hole. inches.	From bed to bottom of ram when up. inches.	Approx. weight. lbs.	Price each.	Stop Motion extra.
0	1⅜	1½	4	4	112	**140/-**	**10/-**
1	1⅝	2	4	6¾	192	**155/-**	**10/-**
2	1⅞	4½	5	7	**280**	**230/-**	**15/-**
2A	2⅛	5	6¼	8	496	**310/-**	**20/-**
3	2½	8	7½	9	**672**	**390/-**	**20/-**
3A	2¾	10	6½	8	812	**600/-**	**40/-**
4	3	12	7½	10¾	1456	**800/-**	**50/-**

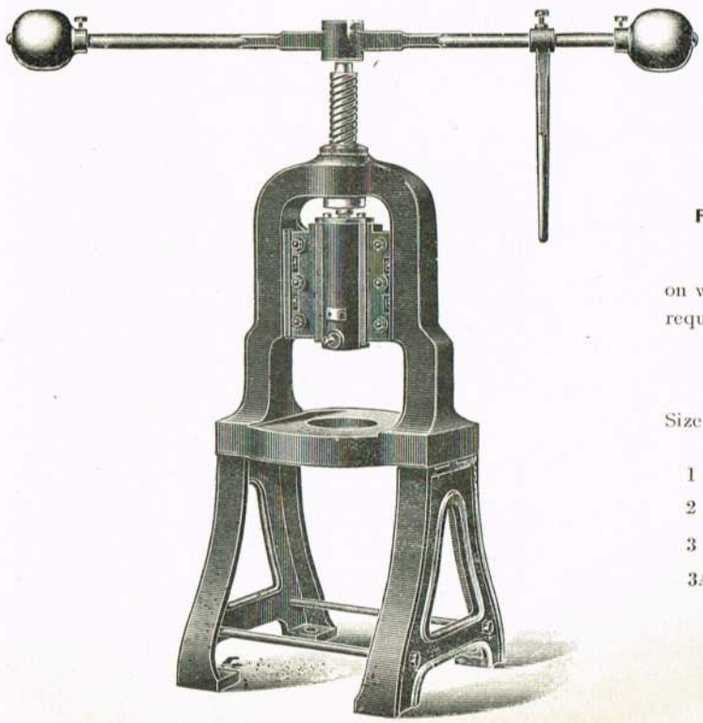

Fig. 1686. SWAN NECK OPEN BACK SCREW PRESS.

Illustration represents Nos. 3 and 3A Sizes. Smaller sizes fitted on with one ball only. Hole in bed can be altered to suit purchaser's requirements.

Size.	Diam. of Screw. inches.	Hole in Bed. inches.	Back to Centre of Slide. inches.	Size of opening in back. inches.	Approx. Weight. lbs.	Bed to bottom of Slide when up. inches.	Price complete on legs.
1	1⅝	2	4½	3	2¼	4	**£14**
2	1⅞	4½	5½	4	3½	6	**£17**
3	2½	8	5¾	7	7½	7	**£40**
3A	3	12	9	7¾	15½	11	**£50**

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PRESSES.

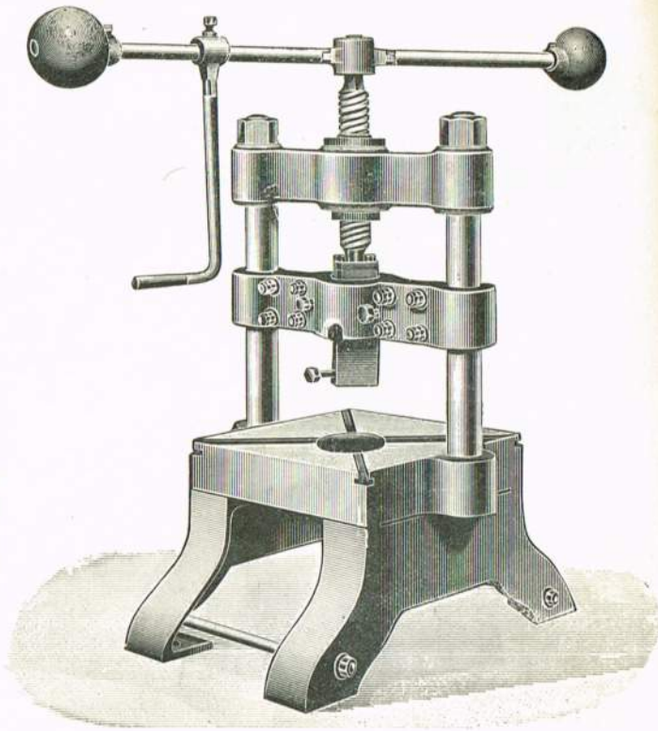

Fig. 1687.

HEAVY DESIGN DOUBLE PILLAR SCREW PRESS.

Pillars are made of steel and turned true. Fitted with T slot bed and the centre bar is adjustable to suit various thicknesses of dies. Can be supplied with or without stand to floor.

Prices and Dimensions.

Size.	Diam. of Screw inches.	Distance between pillars. inches.	Weight with legs. cwts.	Prices with Stand.	Prices without Stand.
1	$1\frac{5}{8}$	12	$3\frac{1}{2}$	**£25 0 0**	**£21 0 0**
2	$1\frac{7}{8}$	15	$4\frac{1}{2}$	**£33 0 0**	**£29 0 0**
3	$2\frac{1}{2}$	18	$7\frac{1}{8}$	**£42 0 0**	**£36 0 0**
4	3	25	22	**£70 0 0**	**£64 0 0**
5	4	31	$25\frac{3}{4}$	**£86 0 0**	**£80 0 0**

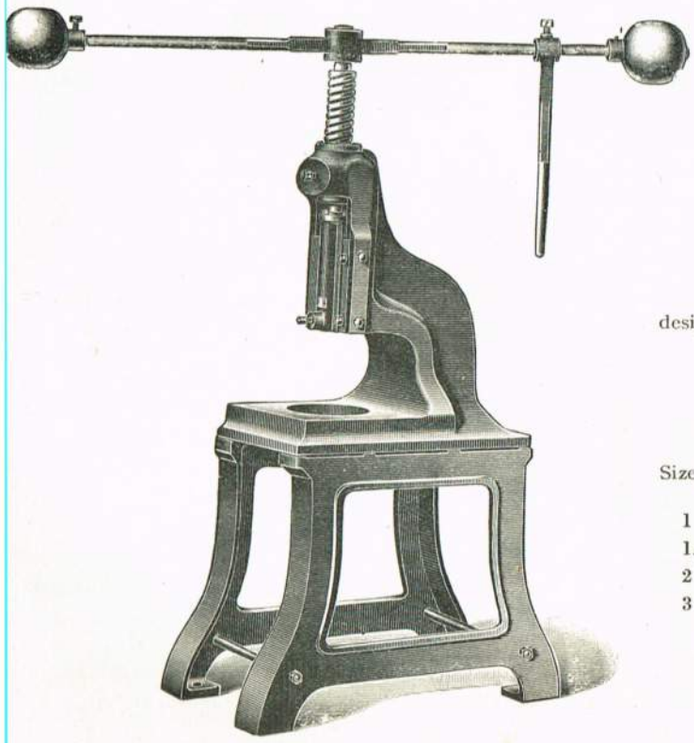

Fig. 1688. DOUBLE ARM SCREW PRESS.

For Stamping, cutting, pressing, etc., Of substantial and rigid design.

Prices and Dimensions.

Size.	Diam. of Screw inches	Approx. Weight with legs cwts.	Hole in Bed inches	Distance between Standards inches	Bed to bottom of Slide when up inches	Price without Stand.	Price with Stand.
1	3	$13\frac{1}{2}$	8	16	6	**£32**	**£40**
1A	3	$15\frac{1}{2}$	12	20	$6\frac{1}{2}$	**£48**	**£60**
2	$3\frac{1}{2}$	21	15	$20\frac{1}{2}$	9	**£58**	**£72**
3	4	32	26	34	9	**£94**	**£110**

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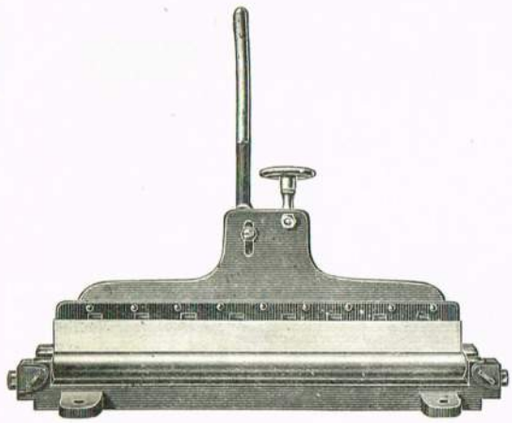

Fig. 1689. FOLDING MACHINES.

Size.	Length inches.	With Parallel Slide. App. weight, lbs.	Price.	Narrow Edge without Roller App. weight, lbs.	Price.
1	12	—	—	23	£5 0 0
2	17¾	38	£4 4 0	48	£5 10 0
3	20¼	56	£4 15 0	70	£7 0 0
4	26	96	£7 0 0	100	£8 10 0
5	28	112	£8 0 0	—	—
6	30	126	£9 0 0	154	£11 0 0
7	36	168	£14 0 0	168	£15 10 0
8	30*	112	£9 0 0	—	—
9	36*	154	£14 0 0	—	—
10	42	—	—	175	£19 0 0
11	48	224	£20 0 0	—	—

* With slot for trunk making.

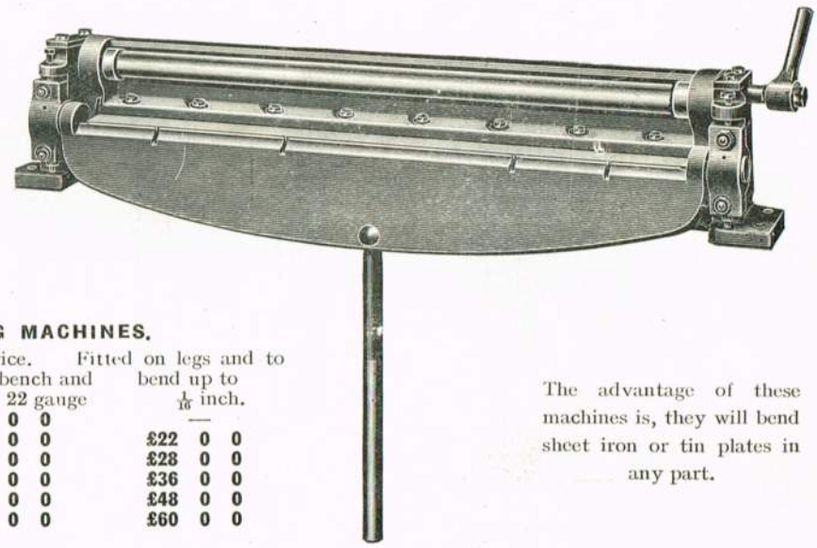

Fig. 1690. CRAMP FOLDING MACHINES.

Size.	Length. Inches.	Approx. Weight. cwts. qr. lbs.	Price. To fit on bench and to bend 22 gauge	Fitted on legs and to bend up to $\frac{1}{16}$ inch.
1	20	1 0 0	£9 0 0	—
2	31	1 2 14	£12 0 0	£22 0 0
3	36	2 0 0	£16 0 0	£28 0 0
4	42	3 0 14	£25 0 0	£36 0 0
5	48	6 3 0	£32 0 0	£48 0 0
6	54	7 3 0	£44 0 0	£60 0 0

The advantage of these machines is, they will bend sheet iron or tin plates in any part.

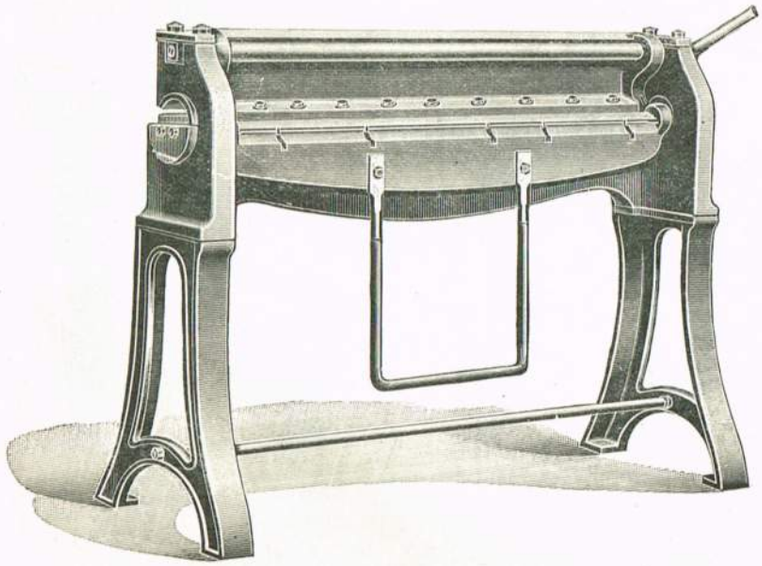

Fig. 1691.

OPEN END CRAMP FOLDING MACHINES.

The machines are strongly constructed and will operate sheets 16 gauge thick. The machine will also do all the work of an ordinary cramp folding machine. Illustration shows fitted with open ends, which permits sheets of any length being folded on the edge.

Size ...	1	2	3	4	5	6
Length...	31	36	42	48	54	60 inches.
Weight...	4	5	7½	8	10	11½ cwts.
Price ...	£30	£34	£48	£60	£70	£78 each.

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TINSMITHS' TOOLS.

BEST QUALITY ONLY.

Fig. 1700.
5lb. Blocking Hammer.
2/10 lb.

Fig. 1701
3lb. Planishing Hammer.
3/- lb.

Fig. 1702.
3lb. Flat Hammer.
3/6 lb.

Fig. 1703.
1 to 2½ lb.
Convex Hammer.
5/- lb.

Fig. 1704.
1 to 2½ lb.
Concave Hammer.
6/- lb.

Fig. 1705.
½ to ¾lb.
Creasing Hammer.
3/6 each.

Fig. 1706.
½ to ¾ lb.
Paning Hammer.
3/6 each.

Fig. 1707.
1 to 1½lb.
Rivetting Hammer.
4/- lb.

Fig. 1708.
3lb.
Smoothing Hammer.
3/- lb.

Fig. 1709.
4 lb.
Hollowing Hammer.
2/4 lb.

Fig. 1710.
1 to 1½ lb.
Round and Square Face Hammer.
5/- lb.

Fig. 1711.
45 lb.
Anvil.
2/8 lb.

Fig. 1712.
14 lb.
Tea Kettle Bottom Stake.
2/8 lb.

Fig. 1713.
15 lb.
Round Bottom Stake.
2/8 lb.

Fig. 1714.
4 lb.
Half Moon Stake.
1/10 lb.

Fig. 1715.
20 lb.
Anvil Stake.
2/8 lb.

Fig. 1716.
3 lb.
Pepper or Flour Box and Tea Pot Top Head.
2/10 lb.

Fig. 1717.
20 lb.
Dripping Pan Stake.
2/10 lb.

Fig. 1718.
Hatchet Stake.
1/10 lb.

Fig. 1719.
15lb. Grooving Stake.
3/- lb.

Fig. 1720.
14lb.
Creasing Iron.
2/10 lb.

Fig. 1721.
20lb.
Funnel Stake.
W.I., **2/-** lb.
Steel Faced, **2/8** lb.

The above weights listed are those generally supplied ; other sizes and tools of special design made to customer's specification.

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TINSMITHS' TOOLS.

MANUFACTURED FROM FINEST MATERIALS ONLY.

Fig. 1722. Pipe Stake. Round and Flat Faces. Wrought Iron, 25—40 lbs. **1/10** lb.

Fig. 1723. 98 lb. 5ft. 6in. × 5in. wide. Cast-iron Hollow Mandrill Stake. **9d.** lb.

Fig. 1724. 70 lb. Cast-iron Mandrill. 18in. flat. 30in. long round. 28 to 120 lbs., **5d,** lb. Ground Face, **9d.** lb.

Fig. 1725. 45 lb. Pipe Stake. Cast-iron, **6d.** lb. Wrought-iron, **1/10** lb.

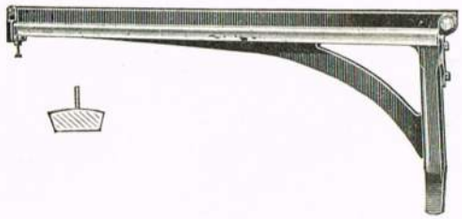

Fig. 1726. Soldering Gibbett. 20 in. long, **40/-** each. 36 in. long, **70/-** each

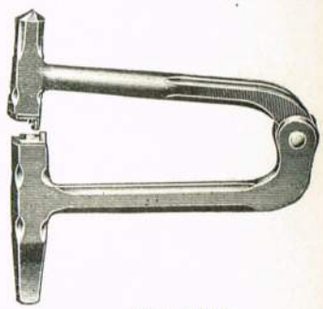

Fig. 1727. Kettle lid swage, **68/-** each.

Fig. 1728. Side Stake. 18—36 lbs. W. Iron, **1/10** lb. C.Iron, **6d.** per lb.

Fig. 1729. Teapot Neck Tool. 5 lbs. **2/8** lb.

Fig. 1730. Tinmen's and Brazier's Horse. 20—35 lbs., **1/6** lb.

Fig. 1731. Saucepan Belly Stake. 20—30 lbs. **2/6** lb.

Fig. 1732. Bick Iron. W.I., 20—30 lbs., **2/2** lb. Over 30 lbs., **2/-** lb.

Fig. 1733. Extinguisher Stake. 7—9 lbs., **2/4** lb.

Fig. 1734. Funnel and Side Stake. W.I., **2/-** lb. Steel faced, **2/6** lb.

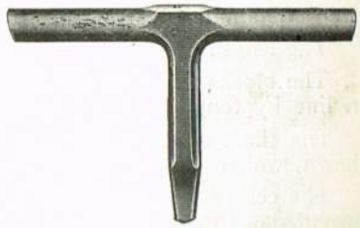

Fig. 1735. Rounding Stake. 25–35 lbs. Cast-iron, **9d.** per lb. Wrought-iron, **1/10** lb

Fig. 1736. Oval Head. 3lbs. **2/8** lb.

Fig. 1737. Square Head. 4lbs. **2/8** lb.

Fig. 1738. Round Head. 3 lbs. **2/8** lb.

Fig. 1739. Long Head. 4 lbs. **2/8** lb.

Fig. 1740. Stud Boss and two Punches. **24/-** per set of three Tools.

The above weights listed are those generally supplied ; other sizes and tools of special design made to customer's specification.

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STRAIGHTENING PRESSES.

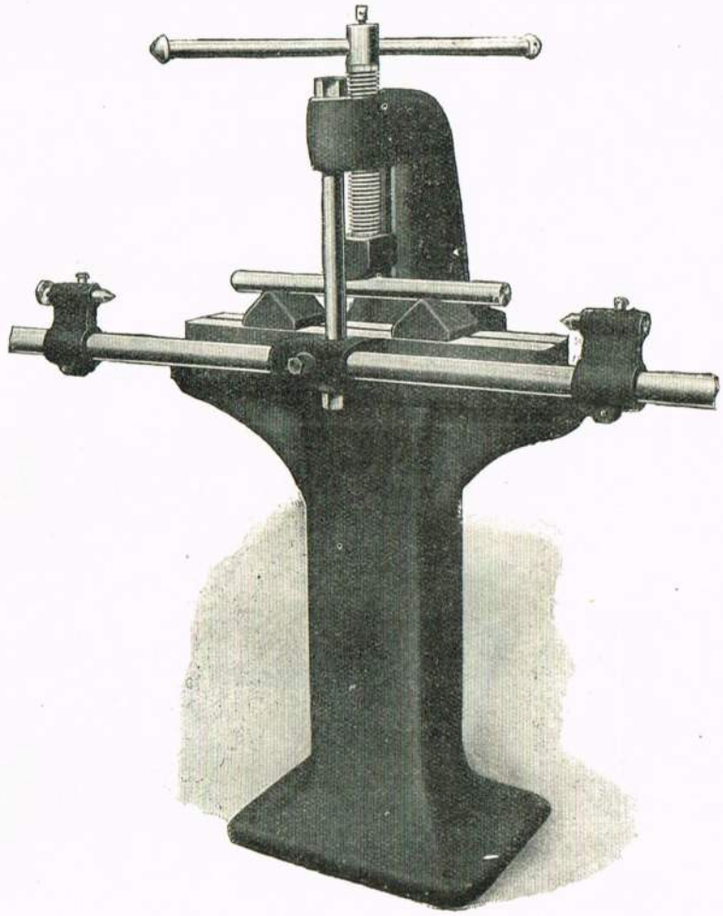

Fig. 1750.

This press is intended to be used for centring work by hand, and also for straightening work which has already been centred. It is a well-known fact that work straightened in a press is more likely to remain so, in the lathe, than if hammered straight.

The length of shaft that can be straightened is not limited, as any length may be dealt with in the press.

The blocks upon which the work rests when being straightened are movable to or from the screw, and are kept in line by tongues which fit the groove shewn.

The shaft is movable through the arm which supports it, being held in any desired position by the set-screw shewn, which has a piece of brass over its points to avoid marring the shaft.

The centre is pressed forward by a spring, and has a knurled head for drawing it back, both centres being provided with small oil wells.

The centring heads are clamped in any desirable position on the shaft by the binding screw shewn.

The block on the end of the screw is of cast steel, case-hardened, and the centres of tool steel, tempered.

Size	A	B
Screw, square thread, 4 per inch, diameter	$1\frac{3}{8}''$	$1\frac{3}{4}''$
Centring shaft	$1\frac{1}{4}'' \times 48''$	$1\frac{1}{2}'' \times 66''$
Capacity, will bend or straighten stock up to	$1\frac{3}{4}''$ diam.	$2\frac{1}{2}''$ diam.
,, will admit work	$2\frac{1}{2}''$ diam.	$3\frac{3}{4}''$ diam.
Floor space, size of base	$18'' \times 14''$	$18'' \times 14''$
Approximate weight, complete with column	308 lbs.	364 lbs.
,, ,, packed for export	434 lbs.	518 lbs.
Case dimensions	$52'' \times 21'' \times 20''$	$56'' \times 32'' \times 24''$
Price—Bench Machine	**£12 15 0**	**£16 10 0**
,, Stand to Floor	**£5 10 0**	**£6 15 0**

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MANDRELL PRESSES.

For Bench or Stand to Floor.

These Presses combine great strength and rigidity with ample leverage, are provided with machine-cut gears and planed tables. The Presses are indispensable in every engineering workshop and garage. They will drive a mandrell in or out without bending it. They will not deface the work. The pinions and rams are made of toughened steel.

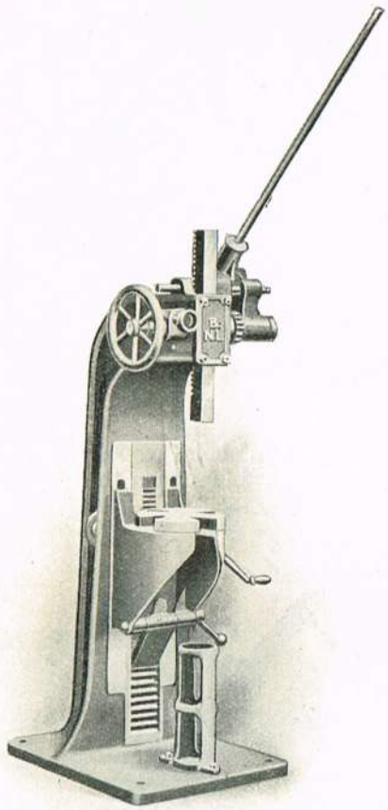

Fig. 1751.
No. 5.

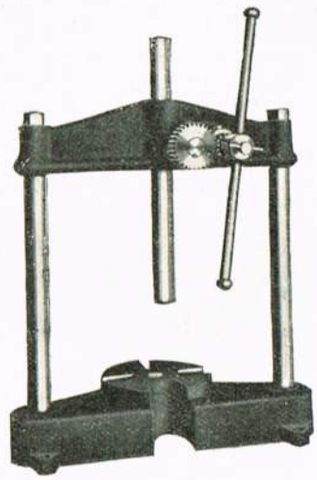

Fig. 1752
Type 00/0.

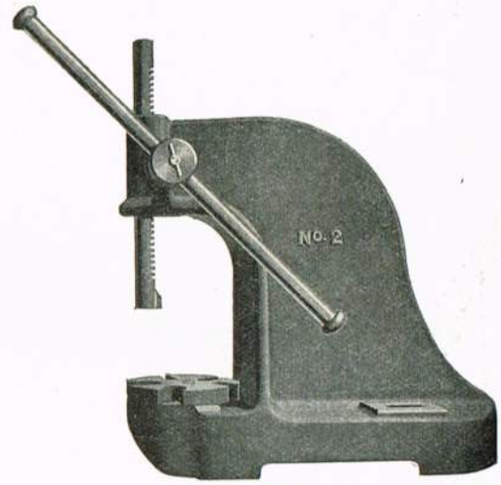

Fig. 1753.
Types 2 to 3½.

Fig. 1754.
Type B Stand.
For Presses 2, 3 and 3A.
Weight 250 lbs.
Price £5 5 0

Fig. 1755.
Type A Stand.
For Press No. 3½.
Weight 310 lbs.
Price .... £6 0 0.

Dimensions and Prices.

Size	Diam. of work. ins.	Height over table. ins.	Weight. lbs.	Largest mandrel. ins.	Price each.
2	8	7	65	1³/₁₆	£3 10 0
3	12	11	120	1¾	£4 10 0
3A	24	11	170	1¾	£7 0 0
3½	18	15	420	2¼	£11 10 0
5	20	24	900	3	£27 0 0

No. 5.—The length of ram 24″×2″ square. Floor space required, 24″×30″. Height overall, 5 ft.

Pressure with 150 lbs. pull = 8 tons.

00	20	18	200	3	£9 10 0
0	20	24	220	3	£10 5 0

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ELECTRIC DRILLS AND HYDRAULIC PRESSES.

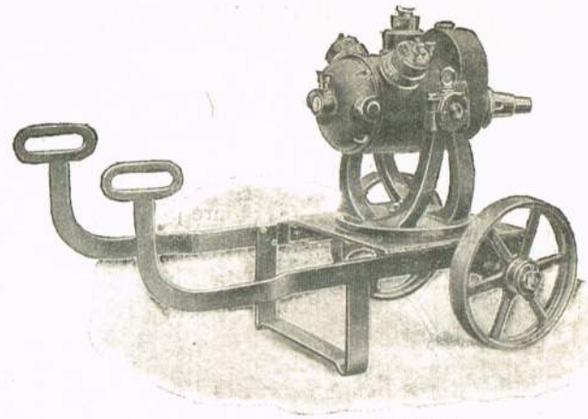
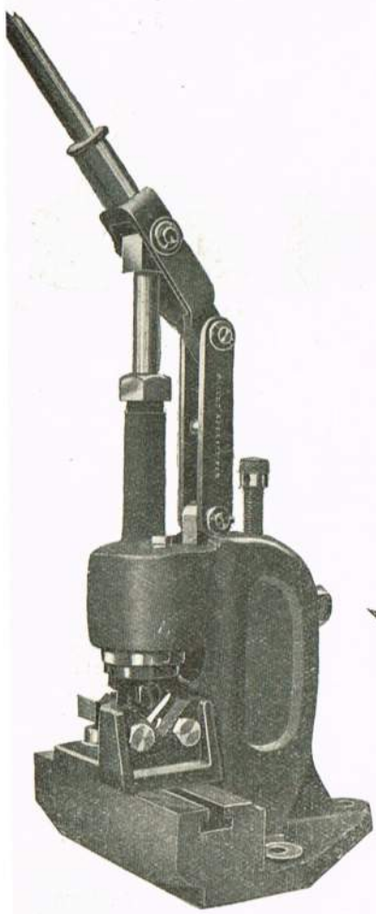


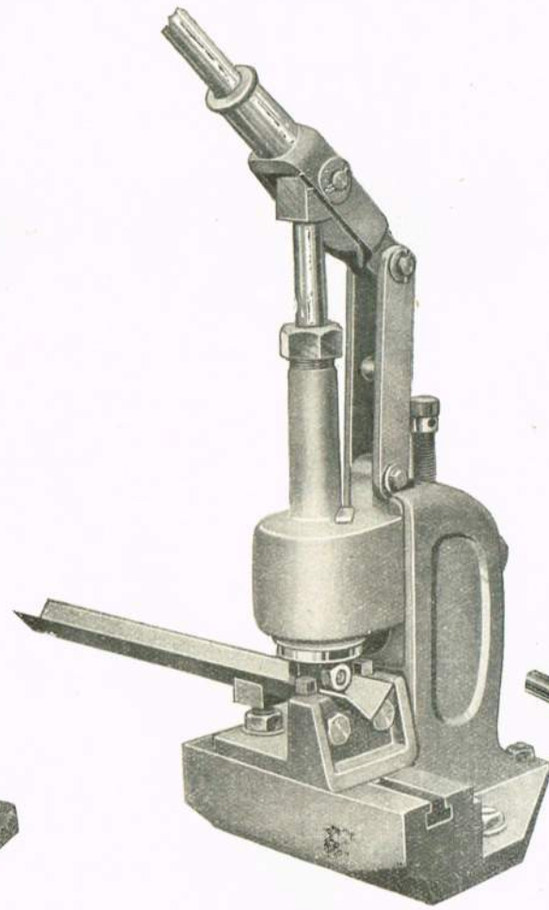
Fig. 1756.

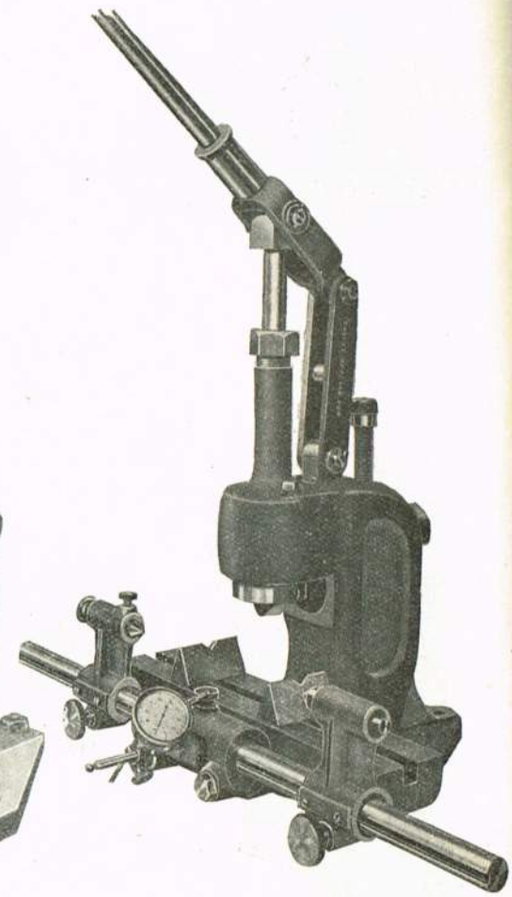
PORTABLE ELECTRIC DRILLING MACHINES.

H.P.	Size of hole drilled	Shaft Projection	R.P.M.	Weight in lbs.	PRICES 250 v. D.C.	500 v. D.C.	250 v. 3-phase	500 v. 3-phase
$\frac{1}{2}$	$1\frac{1}{2}''$	1	140	205	**£46**	**£48**	**£50**	**£52**
1	$1\frac{3}{4}''$	$1\frac{1}{2}''$	80	264	**£52**	**£54**	**£54**	**£57**
2	$2^{5}/_{32}''$	$2''$	60	330	**£60**	**£64**	**£60**	**£64**

Single-phase prices as for three-phase, but outputs reduced to $1\frac{1}{8}''$, $1^{13}/_{32}''$ and $1^{3}/_{16}''$ holes respectively. Flexible shafts and accessories supplied at extra cost as required. Larger machines arranged for one or three speeds, quoted for.







HYDRAULIC PRESSES.

Fig. E1757.
Type H.S.P. Weight 120 lbs.
Bar Straightening Press.

Fig. 1758.
Type H.L.P. Weight 56 lbs.
Punch and Rivetting Press.

Fig. 1759.
Type H.C. Weight 100 lbs.
Rod and Section Cropper.

The above are an entirely new type of Valveless Hydraulic Tools for punching, pressing and shearing. They are extremely simple and rigid. Made of solid steel throughout. The operation takes place with a single pull of the hand lever, a resultant pressure of 6 tons being obtained.

Price .... **£12 10 0.** Price .... **£10 0 0.** Price .... **£13 0 0.**

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ELECTRIC DRILLS AND GRINDERS.

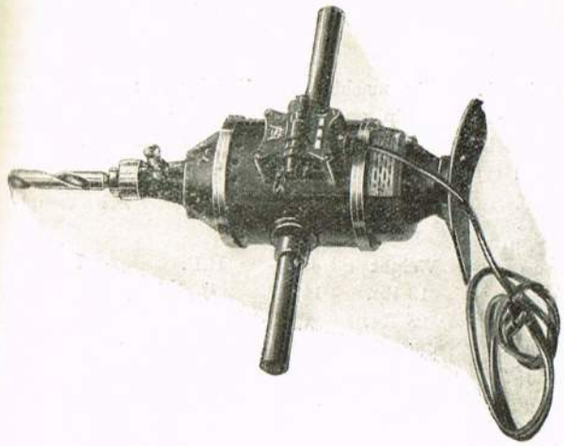

Fig. 1770.

UNIVERSAL TYPE OF MOTOR,

Running on D.C. or A.C. (25–60 cycles). For 90–125 and 190–250 volts. All parts are accessible. Runs on ball-bearings. Also provided with a thrust bearing of large dimensions. Brushes can be removed without dismantling. Each drill comprises Morse taper socket, black plate, two handles, 10 ft. of cable and plug and quick-break switch.

No.	Capacity	Morse taper	Speed r.p.m.	Weight	Price
B1	$\frac{5}{8}$	1	300–350	15 lbs.	**£15 10 0**
B2	$\frac{7}{8}$	2	250–500	18 lbs.	**£18 10 0**

Note Extras.

Type B1 only is furnished with "eye" type handle.

Feed screws, hand wheel type, **16**/– each.

ACCESSORIES FOR ABOVE.

Hand wheel type feed screw can be fitted without removing breast plate, **21**/– each.

Drill post. Strong pillar pattern, with heavy cast iron base, fitted with adjustable arm, used in conjunction with feed screw. **90**/– each.

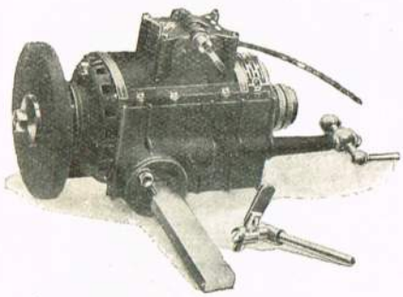

Fig. 1771. With wheel and tool rest.

LATHE GRINDING ATTACHMENTS WITH UNIVERSAL MOTORS.

For 90–125 and 190–250 volts.

For external and internal grinding of spindles, cylinders, crankshafts, etc. Also for grinding tools. The motor spindle is fitted with a taper end for adapting an extension spindle for internal grinding. The whole is mounted on a rectangular bar for fitting to lathe slides, planing and milling machines. This bar is adjusted to various angles. The motor is $\frac{1}{4}$-h.p., running equally well on A.C. or D.C.

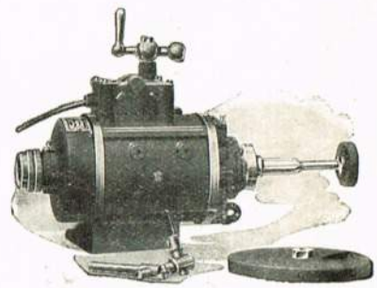

Fig. 1772. Grinder mounted on set square for vertical displacement.

It has a series characteristic so that the speed is regulated automatically according to effort demanded. All internal parts are fully protected. Fitted throughout with ball bearings. Speed, 8,000 r.p.m. without load; 3,500 r.p.m. under load.

Equipment includes: One 6″ grinding wheel, one device for horizontal displacement, 10 ft. of flexible wire and plug, one quick-break motor switch, one adjustable fixing device for attachment to tool holder of lathe. Weight complete, $15\frac{1}{2}$ lbs.

PRICE ... ... **£14 5 0.**

Accessories—Small Axial Extension Spindle, 4″ long, with 2″ grinding disc. Price **17/6**.

Tooth Rest in 4 parts, for supporting teeth when grinding milling cutters. Price **14**/–.

Set Square with hand wheel for vertical displacement. Price **75**/–.

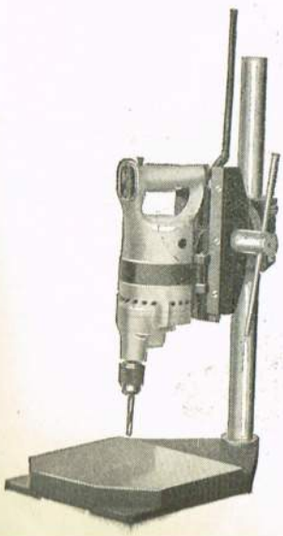

Fig. 1773.

SMALL PORTABLE HAND DRILL FOR HIGH AND LOW VOLTAGE.

This electric drill is one of the most reliable on the market. The voltage is universal for A.C. or D.C. for 110 or 220 volts, developing about $\frac{1}{4}$-h.p. Well ventilated and having a reliable and simple system of lubrication. Speed at spindle is 1300 r.p.m. The gears are spiral bevel pattern from nickel alloy steel. Ample proportion bearings, with ball bearing to take thrust. Jacob chuck is supplied. Complete with 10 ft. of double flexible cord and adapter for lamp holder. Will take from 0 to $\frac{1}{4}$″ drill. Weight 4 lbs. Length overall, $11\frac{1}{4}$″.

Drills up to	Price
$\frac{1}{4}$ in.	**£9 12 6**
$\frac{1}{2}$ in.	**£16 5 0**

ACCESSORIES.

Cast iron stand, as shewn, **£3 15 0** each. Emery wheels, **7/6** each.

Bench base, **10**/– each.

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ELECTRIC DRILLS, GRINDERS & POLISHERS.

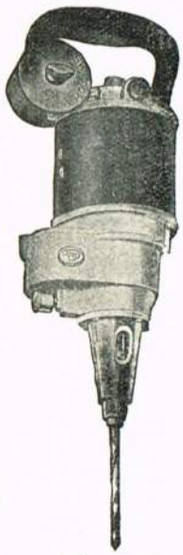

Fig. 1774.

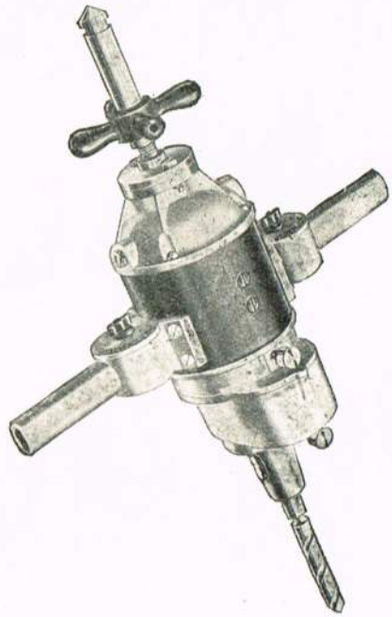

Fig. 1775/8.

All the electric drilling machines supplied by us are of the finest material and workmanship, and are thoroughly dependable in every way. **Hand Drilling Machines.** Dimensions and Prices.

All types are fitted with Morse Taper Shanks.

Fig. No.	Drill up to	Weight	Length without drill	H.P.	Price complete with switch and drill chuck
1774	$\frac{3}{8}''$	13 lbs.	14″	$^1/_{16}''$	**£12 0 0**
1775	$\frac{7}{8}''$	25 lbs.	20″	$\frac{1}{8}''$	**£18 10 0**
1776	$1\frac{1}{8}''$	45 lbs.	23″	$\frac{1}{4}''$	**£26 0 0**
1777	$1\frac{5}{8}''$	72 lbs.	28″	$\frac{1}{2}''$	**£32 0 0**
1778	2″	90 lbs.	—	1″	**£48 0 0**

Figs. 1775 to 8 Supplied complete with breast plate feed screw, reversing switch and 6 ft. of suitable cable.

ELECTRIC HAND AND SLIDE REST GRINDERS.

Slide rest grinders can be supplied with screw feed at extra cost. These machines run at 2,800 r.p.m.

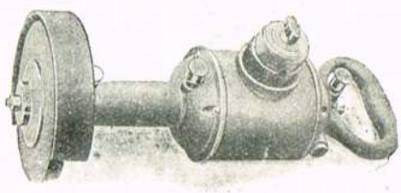

Fig. 1780. Portable Type.

H.P.	Weight	Suitable disc size	Price
$\frac{1}{8}$	$17\frac{1}{2}$lbs.	$6\frac{1}{2}'' \times {}^9/_{16}''$	**£11 0 0**
$\frac{1}{4}$	33 lbs.	$6\frac{3}{4}'' \times {}^{13}/_{16}''$	**£14 0 0**
$\frac{1}{2}$	48 lbs.	$6\frac{1}{4}'' \times 1''$	**£18 10 0**
1	66 lbs.	$6\frac{3}{4}'' \times 1^3/_{16}''$	**£27 10 0**

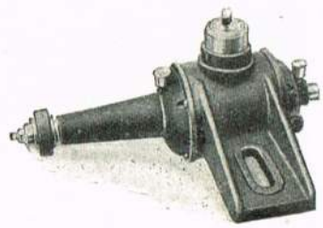

Fig. 1781. Inside Grinder.

H.P.	Weight	Suitable disc size	Price
$\frac{1}{8}$	22 lbs.	$1\frac{3}{8}'' \times \frac{3}{8}''$	**£11 0 0**
$\frac{1}{4}$	33 lbs.	$2\frac{3}{4}'' \times {}^9/_{16}''$	**£13 10 0**
$\frac{1}{2}$	$61\frac{1}{2}$lbs.	$3\frac{1}{2}'' \times 1''$	**£18 0 0**
1	77 lbs.	$4'' \times 1^3/_{16}''$	**£27 10 0**

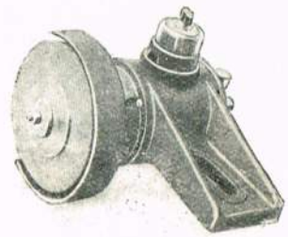

Fig. 1782. Outside Grinder.

H.P.	Weight	Suitable disc size	Price
$\frac{1}{8}$	22 lbs.	$6'' \times {}^9/_{16}''$	**£10 10 0**
$\frac{1}{4}$	33 lbs.	$6\frac{3}{4}'' \times {}^{13}/_{16}''$	**£13 0 0**
$\frac{1}{2}$	$61\frac{1}{2}$lbs.	$6\frac{3}{4}'' \times 1''$	**£17 10 0**
1	77 lbs.	$6\frac{3}{4}'' \times 1^3/_{16}''$	**£26 10 0**

Prices are for 200–250 volt Direct Current Tools. Slight variations for other voltages and for three-phase alternating current machines. Two-phase prices about 10% higher. Single-phase machines same prices, but reduced outputs.

GRINDING AND POLISHING MACHINES.

D.C. and 3-Phase Machines.

Speed	Grinding Disc.	Weight lbs.	PRICES 250 v. D.C.	500 v. D.C.	250 v. 3-phase S.C.§	250 v. 3-phase S.R.§	500 v. 3-phase S.C.§	500 v. 3-phase S.R.§
...2,800	—	13	**£8/10**	—	**£8/10**		—	
...	$4'' \times \frac{1}{2}''$	22	**£11**	**£11/10**	**£11/10**		**£12**	
...	$6\frac{1}{2}'' \times \frac{5}{8}''$	40	**£14**	**£14/10**	**£14/10**		**£15**	
...	$6\frac{3}{4}'' \times \frac{5}{8}''$	68	**£19**	**£20**	**£19/10**		**£20/10**	
...1,500	$10'' \times 1\frac{1}{4}''$	140	**£34/10**	**£38**	**£30/10**	**£34/10**	**£32/10**	**£38**
...	$10'' \times 1^9/_{16}''$	160	**£45/10**	**£49**	**£39/10**	**£45/10**	**£41/10**	**£49**

Single-Phase Machines.

Speed	Grinding Disc.	Weight lbs.	PRICES 250 volts S.C.	250 volts S.R.	500 volts S.C.	500 volts S.R.
...2,800	$4'' \times \frac{3}{8}''$	22	**£14**	—	**£15**	—
...	$6\frac{1}{2}'' \times {}^3/_{16}''$	$39\frac{1}{2}$	**£16/10**	—	**£17**	—
...	$6\frac{3}{4}'' \times \frac{5}{8}''$	68	**£22/10**	—	**£23**	—
...1,500	$10'' \times 1\frac{1}{4}''$	132	**£34/10**	**£34/10**	**£36/10**	**£43**
...	$10'' \times 1^9/_{16}''$	154	**£45**	**£45/10**	**£46/10**	**£56**

§ S.C. = Squirrel Cage Motor. § S.R. = Slip Ring Motor.

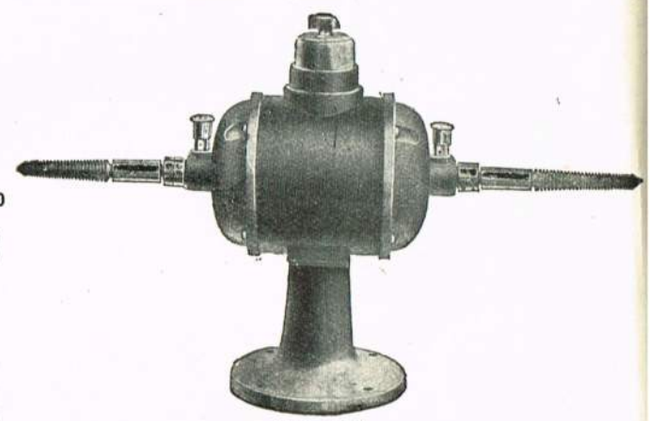

Fig. 1783.

N.B.—The larger machines are much more substantial and massive than illustrated.

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GRINDING WHEELS.

PRICE LIST—Straight Wheels.

Aloxite and Carborundum.

Subject to Discount.

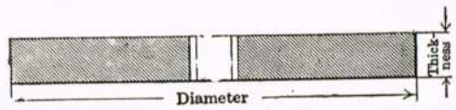

Fig. 1784. STRAIGHT WHEELS.

Thickness of Wheels in Inches.

Dia.	¼	⅜	½	⅝	¾	⅞	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾
1″	1/9	2/–	2/3	2/6	2/9	3/–	3/3	3/6	4/–	4/6	5/–	5/6	6/–	6/6	7/–	7/6	8/–	8/6
1½″	2/–	2/3	2/6	2/9	3/–	3/3	3/6	4/–	4/6	5/–	5/6	6/–	6/6	7/3	8/–	8/6	9/–	9/6
2″	2/6	2/9	3/3	3/6	3/9	4/3	4/6	5/–	5/9	6/3	7/–	7/6	8/–	8/9	9/3	10/–	10/6	11/–
2½″	2/9	3/3	3/9	4/–	4/3	4/9	5/3	5/9	6/3	7/–	7/9	8/6	9/–	9/9	10/6	11/3	11/9	12/6
3″	3/3	3/6	4/–	4/3	4/9	5/3	5/9	6/3	7/3	8/–	8/9	9/6	10/3	11/–	11/9	12/6	13/3	14/–
3½″	3/6	4/–	4/6	5/–	5/6	6/–	6/6	7/3	8/–	8/9	9/6	10/6	11/3	12/–	13/–	14/–	14/9	15/6
4″	4/3	4/9	5/3	5/9	6/3	7/–	7/6	8/6	9/6	10/6	11/9	12/9	14/–	15/–	16/–	17/–	18/–	19/3
4½″	5/–	5/6	6/3	6/9	7/3	8/–	8/9	10/–	11/–	12/6	13/9	15/–	16/3	17/6	18/9	20/–	21/–	22/–
5″	5/9	6/3	7/3	8/–	8/6	9/3	10/–	11/6	12/9	14/3	15/6	17/–	18/6	20/–	21/6	23/–	24/–	25/6
6″	7/3	8/–	9/–	10/–	11/–	11/9	12/9	14/9	16/6	18/6	20/–	22/–	24/–	26/–	28/–	30/–	32/–	34/–
7″	8/9	10/–	11/–	12/3	13/6	14/9	16/3	18/6	21/–	23/6	26/–	28/–	31/–	33/6	36/–	38/–	41/–	43/–
8″	10/3	11/9	13/3	14/9	16/6	18/–	19/6	23/–	26/–	29/–	32/–	35/–	39/–	42/–	45/–	48/–	51/6	55/–
9″	11/9	13/9	15/6	17/6	19/6	21/–	23/–	27/–	31/6	36/–	40/–	44/–	48/–	51/6	56/–	61/–	66/–	70/–
10″	13/6	16/3	18/6	21/–	23/–	26/–	28/–	33/–	38/–	44/–	49/–	55/–	60/–	66/–	71/–	76/–	82/–	86/–
12″	17/3	19/3	23/–	26/–	29/–	32/6	36/–	43/–	49/–	56/–	62/–	70/–	77/–	85/–	92/–	100/–	107/–	114/–
14″	...	...	29/–	34/–	38/6	43/–	48/–	57/–	66/–	75/–	85/–	95/–	105/–	115/–	125/–	135/–	145/–	155/–
16″	...	...	...	...	49/–	55/6	62/–	74/–	87/–	99/–	111/–	124/–	136/–	148/–	160/–	173/–	185/–	197/–
18″	...	...	...	...	...	...	76/–	92/–	108/–	123/–	139/–	154/–	168/–	183/–	198/–	212/–	227/–	241/–
20″	...	...	...	...	...	...	...	113/–	131/–	150/–	168/–	186/–	203/–	221/–	239/–	256/–	274/–	292/–
22″	...	...	...	...	...	...	...	139/–	161/–	183/–	206/–	228/–	250/–	272/–	294/–	315/–	337/–	360/–
24″	...	...	...	...	...	...	...	165/–	191/–	219/–	244/–	272/–	297/–	325/–	350/–	375/–	403/–	428/–
26″	...	...	...	...	...	...	...	187/–	219/–	250/–	281/–	315/–	347/–	381/–	416/–	447/–	481/–	516/–
28″	...	...	...	...	...	...	...	216/-	259/–	303/–	347/–	384/–	425/–	462/–	500/–	534/–	572/–	606/–
30″	...	...	...	...	...	...	...	244/–	287/–	334/–	378/–	422/–	465/–	512/–	556/–	600/–	644/–	690/–
32″	...	...	...	...	...	...	...	...	334/–	387/–	441/–	494/–	547/–	600/–	656/–	703/–	750/–	797/–
34″	...	...	...	...	...	...	...	...	384/–	447/–	506/–	569/–	628/–	690/–	750/–	800/–	853/–	903/–
36″	...	...	...	...	...	...	...	...	444/–	512/–	578/–	647/–	716/–	775/–	831/–	891/–	947/–	1006/–
38″	...	...	...	...	...	...	...	...	...	...	650/–	716/–	781/–	847/–	912/–	975/–	1041/–	1106/–
40″	...	...	...	...	...	...	...	...	...	...	722/–	794/–	866/–	937/–	1009/–	1081/–	1153/–	1225/–
42″	...	...	...	...	...	...	...	...	...	...	...	...	956/–	1037/–	1116/–	1197/–	1278/–	1356/–
44″	...	...	...	...	...	...	...	...	...	...	...	...	1053–″	1144/–	1231/–	1322/–	1409/–	1500/–
46″	...	...	...	...	...	...	...	...	...	...	...	...	1153/–	1253/–	1350/–	1450/–	1547/–	1647/–
48″	...	...	...	...	...	...	...	...	...	...	...	...	1256/–	1356/–	1472/–	1581/–	1691/–	1797/–
50″	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1600/–	1719/–	1837/–	1956/–
52″	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1728/–	1859/–	1991/–	2122/–
54″	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1859/–	2003/–	2147/–	2287/–
56″	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1994/–	2150/–	2306/–	2462/–
58″	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2131/–	2303/–	2472/–	2644/–
60″	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2272/–	2459/–	2644/–	2831/–

RULES FOR CALCULATING LIST PRICES.

Diameters.

Wheels with diameters less than 1″ take the list of a 1″ wheel.

Wheels with diameters in odd inches or fractional parts of inches, intermediate to diameters shown in list, take the list of the next larger diameter.

Example—A wheel 5½″ diameter takes the list of a 6″ wheel, and a wheel 12½″ diameter, or 13″ diameter, takes the list of a 14″ wheel.

Thickness.

Wheels thinner than one-quarter of an inch take the list of a wheel one-quarter inch thick.

Wheels with thicknesses intermediate to those shown in list take the list of the next thicker wheel.

Example—A wheel 2⅝″ thick takes the list of a 2¾″ wheel.

Wheels thicker than 8″ are figured proportionately to the 8″ thickness ; thickness to increase from 8″ by ¼″, and any intermediate fractional part of an inch to be figured at the next higher quarter of an inch.

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GRINDING WHEELS.

Fig. 1780. STRAIGHT WHEELS (continued).

Aloxite and Carborundum.

Thickness of Wheels in Inches.

Dia.	4	4¼	4½	4¾	5	5¼	5½	5¾	6	6¼	6½	6¾	7	7¼	7½	7¾	8
1″ ...	9/–	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1½″....	10/–	10/6	11/–	11/9	12/3	12/9	13/3	14/–	14/9	...	...	...	...	...	...	...	...
2″ ...	11/9	12/6	13/3	14/–	14/9	15/3	16/–	16/6	17/6	18/–	18/9	19/3	20/–	21/–	21/6	22/–	23/–
2½″....	13/3	14/–	14/9	15/6	18/6	17/3	18/–	18/9	19/9	20/6	21/–	22/–	23/–	24/–	24/6	25/–	26/–
3″ ...	14/9	15/6	16/9	17/6	18/6	19/3	20/–	21/–	22/–	23/–	24/–	25/–	25/6	26/–	27/–	28/–	29/–
3½″....	16/6	17/6	18/6	19/3	20/6	21/6	22/6	23/6	24/6	25/6	26/6	27/6	28/–	29/–	30/–	31/–	32/–
4″ ...	20/–	21/6	23/–	24/–	25/–	26/6	28/–	29/–	30/–	31/–	32/6	33/6	35/–	36/–	37/–	38/6	40/–
4½″....	24/–	25/–	27/–	28/–	29/6	31/–	32/–	33/6	35/–	36/6	38/–	39/–	41/–	42/–	43/6	45/–	46/–
5″ ...	27/–	29/–	30/6	32/–	33/6	35/–	37/–	38/–	40/–	41/6	43/–	45/–	46/–	48/–	49/6	51/–	53/–
6″ ...	36/–	37/6	40/–	42/–	44/–	46/–	48/6	50/–	52/6	54/6	57/–	59/–	61/–	63/–	65/–	67/–	69″–
7″ ...	46/–	49/–	52/–	54/6	57/–	60/–	62/–	65/–	68/–	71/–	74/–	76/–	79/–	82/–	85/–	87/–	90/–
8″ ...	58/–	61/–	65/–	68/–	72/–	75/–	79/–	82/–	86/–	89/–	92/–	96/–	99/–	103/–	106/–	110/–	113/–
9″ ...	75/–	79/–	84/–	88/–	92/–	97/–	101/–	106/–	110/–	115/–	119/–	123/–	128/–	132/–	137/–	141/–	146/–
10″ ...	91/–	97/–	102/–	108/–	113/–	118/–	124/–	129/–	135/–	140/–	146/–	151/–	156/–	162/–	167/–	173/–	178/–
12″ ...	122/–	129/–	136/–	144/–	151/–	158/–	165/–	173/–	180/–	187/–	195/–	202/–	209/–	216/–	223/–	230/–	237/–
14″ ...	165/–	175/–	185/–	195/–	205/–	215/–	224/–	234/–	244/–	254/–	264/–	273/–	283/–	293/–	303/–	312/–	323/–
16″ ...	209/–	222/–	234/–	246/–	259/–	271/–	284/–	296/–	309/–	321/–	333/–	346/–	358/–	371/–	383/–	396/–	408/–
18″ ...	256/–	271/–	286/–	302/–	317/–	332/–	347/–	363/–	378/–	393/–	408/–	424/–	439/–	454/–	469/–	484/–	500/–
20″ ...	309/–	328/–	346/–	364/–	383/–	401/–	420/–	438/–	456/–	474/–	493/–	511/–	530/–	548/–	567/–	585/–	603/–
22″ ...	381/–	404/–	427/–	450/–	472/–	495/–	517/–	540/–	563/–	585/–	608/–	631/–	653/–	676/–	699/–	722/–	744/–
24″ ...	453/–	481/–	506/–	534/–	562/–	587/–	615/–	641/–	669/–	697/–	722/–	750/–	775/–	803/–	831/–	856/–	884/–
26″ ...	550/–	581/–	615/–	647/–	681/–	712/–	747/–	778/–	812/–	844/–	878/–	909/–	944/–	975/–	1009/–	1041/–	1072/–
28″ ...	641/–	678/–	716/–	753/–	791/–	831/–	869/–	909/–	947/–	984/–	1025/–	1062/–	1100/–	1137/–	1175/–	1212/–	1250/–
30″ ...	734/–	778/–	822/–	862/–	906/–	950/–	994/–	1037/–	1081/–	1125/–	1169/–	1212/–	1256/–	1300/–	1344/–	1387/–	1431/–
32″ ...	844/–	894/–	944/–	994/–	1044/–	1094/–	1144/–	1194/–	1244/–	1294/–	1344/–	1394/–	1444/–	1494/–	1544/–	1594/–	1647/–
34″ ...	953/–	1009/–	1065/–	1122/–	1178/–	1234/–	1290/–	1347/–	1403/–	1459/–	1515/–	1572/–	1628/–	1684/–	1740/–	1800/–	1859/–
36″ ...	1062/–	1128/–	1194/–	1256/–	1319/–	1381/–	1444/–	1506/–	1569/–	1631/–	1694/–	1756/–	1819/–	1881/–	1944/–	2006/–	2072/–
38″ ...	1172/–	1241/–	1309/–	1378/–	1447/–	1515/–	1584/–	1653/–	1722/–	1791/–	1859/–	1928/–	1997/–	2069/–	2141/–	2212/–	2284/–
40″ ...	1297/–	1372/–	1447/–	1522/–	1597/–	1672/–	1747/–	1825/–	1903/–	1981/–	2059/–	2137/–	2216/–	2294/–	2372/–	2450/–	2528/–
42″ ...	1437/–	1522/–	1606/–	1691/–	1775/–	1859/–	1944/–	2028/–	2112/–	2197/–	2281/–	2366/–	2453/–	2541/–	2628/–	2715/–	2803/–
44″ ...	1587/–	1681/–	1775/–	1869/–	1962/–	2056/–	2150/–	2244/–	2337/–	2431/–	2525/–	2619/–	2712/–	2806/–	2903/–	3000/–	3097/–
46″ ...	1744/–	1847/–	1950/–	2053/–	2156/–	2259/–	2362/–	2466/–	2569/–	2672/–	2775/–	2878/–	2981/–	3084/–	3187/–	3294/–	3400/–
48″ ...	1906/–	2019/–	2131/–	2244/–	2356/–	2469/–	2581/–	2694/–	2806/–	2919/–	3031/–	3144/–	3256/–	3372/–	3487/–	3603/–	3719/–
50″ ...	2075/–	2197/–	2319/–	2441/–	2562/–	2684/–	2806/–	2928/–	3050/–	3172/–	3297/–	3422/–	3547/–	3672/–	3797/–	3922/–	4047/–
52″ ...	2250/–	2381/–	2512/–	2644/–	2775/–	2909/–	3044/–	3178/–	3312/–	3447/–	3581/–	3716/–	3850/–	3984/–	4119/–	4253/–	4387/–
54″ ...	2431/–	2575/–	2719/–	2862/–	3006/–	3150/–	3294/–	3437/–	3581/–	3725/–	3869/–	4012/–	4156/–	4300/–	4447/–	4594/–	4740/–
56″ ...	2619/–	2772/–	2925/–	3078/–	3231/–	3387/–	3544/–	3700/–	3856/–	4012/–	4169/–	4325/–	4481/–	4637/–	4794/–	4950/–	5106/–
58″ ...	2812/–	2978/–	3144/–	3309/–	3475/–	3641/–	3806/–	3972/–	4137/–	4303/–	4472/–	4441/–	4809/–	4978/–	5147/–	5316/–	5484/–
60″ ...	3015/–	3194/–	3372/–	3550/–	3728/–	3906/–	4084/–	4262/–	4440/–	4619/–	4797/–	4975/–	5156/–	5337/–	5519/–	5700/–	5881/–

Arbor Holes.

Allowances are made on all wheels, except those which are countersunk on either or both sides and wheels with raised dovetails, calculated on the list value of a wheel represented by the hole. List of allowances on application.

No allowance for holes is made on straight wheels which are countersunk on either or both sides exceeding ¼″, or on wheels with recessed or raised dovetails of certain types, as the additional work involved on this class of wheels more than offsets any saving in materials due to holes.

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GRINDING WHEELS.

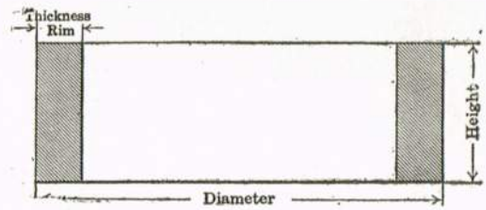

Fig. 1781. CYLINDER WHEELS. General Price List. Subject to Discount.

Dia. Ins.	Height Ins.	Thickness of Rims in inches. 1	1½	2	2½	3	3½	4
8	4	51/–	...	...	...	...	...	...
8	5	63/–	...	...	...	...	...	...
8	6	75/–	...	...	...	...	...	...
8	7	87/6	...	...	...	...	...	...
8	8	99/6	...	...	...	...	...	...
9	4	65/6	67/6	...	...	...	...	...
9	5	81/–	84/–	...	...	...	...	...
9	6	97/–	100/–	...	...	...	...	...
9	7	112/–	116/–	...	...	...	...	...
9	8	128/–	132/–	...	...	...	...	...
10	4	80/–	82/–	84/–	...	...	...	...
10	5	99/–	101/6	104/6	...	...	...	...
10	6	118/–	121/–	124/–	...	...	...	...
10	7	137/–	141/–	144/6	...	...	...	...
10	8	156/–	160/–	164/6	...	...	...	...
12	4	100/–	107/–	110/–	113/–	115/–	...	...
12	5	125/–	132/6	136/6	139/6	142/–	...	...
12	6	150/–	158/–	163/–	166/6	169/6	...	...
12	7	175/–	183/6	189/–	193/–	197/–	...	...
12	8	200/–	209/–	215/–	220/–	224/–	...	...
14	4	117/–	123/–	129/–	150/6	154/–	156/–	158/–
14	5	144/6	152/–	159/6	186/6	190/6	193/6	196/–
14	6	172/–	181/–	190/–	222/–	227/–	230/6	234/–
14	7	200/–	210/–	221/–	258/–	263/6	267/6	271/–
14	8	228/–	240/–	251/6	294/–	300/–	305/–	309/–
16	4	143/–	152/–	161/–	167/–	173/–	194/6	198/–
16	5	177/–	188/–	199/–	206/–	214/–	240/–	245/–
16	6	211/–	224/–	237/–	246/–	255/–	287/–	291/6
16	7	245/–	260/–	275/–	285/6	296/–	333/–	339/–
16	8	279/–	296/–	313/–	325/–	337/–	379/–	386/–
18	4	173/–	181/–	190/–	199/–	208/–	214/–	220/–
18	5	214/–	225/–	235/–	246/–	257/–	265/–	272/–
18	6	255/–	268/–	280/–	293/–	306/–	315/–	324/–

Dia. Ins.	Height Ins.	Thickness of Rims in inches. 1	1½	2	2½	3	3½	4
18	7	296/–	311/–	326/–	341/–	355/–	366/–	376/–
18	8	337/–	354/–	371/–	388/–	405/–	417/–	429/–
20	4	207/–	216/–	226/–	235/–	243/–	252/–	261/–
20	5	256/–	268/–	279/–	290/–	301/–	312/–	323/–
20	6	305/–	319/–	333/–	346/–	359/–	372/–	384/–
20	7	354/–	370/–	386/–	401/–	417/–	431/–	446/–
20	8	404/–	422/–	440/–	457/–	474/–	491/–	508/–
22	4	255/–	269/–	279/–	289/–	298/–	307/–	316/–
22	5	319/–	332/–	346/–	357/–	369/–	379/–	391/–
22	6	378/–	396/–	412/–	426/–	439/–	452/–	465/–
22	7	440/–	460/–	478/–	494/–	510/–	525/–	540/–
22	8	500/–	524/–	544/–	563/–	581/–	598/–	615/–
24	4	262/–	280/–	299/–	340/–	351/–	360/–	370/–
24	5	327/–	349/–	371/–	423/–	436/–	447/–	459/–
24	6	388/–	414/–	441/–	502/–	518/–	532/–	545/–
24	7	448/–	479/–	510/–	581/–	600/–	616/–	632/–
24	8	513/–	548/–	583/–	664/–	685/–	703/–	721/–
26	4	...	342/–	359/–	378/–	395/–	437/–	448/–
26	5	...	423/–	445/–	468/–	490/–	541/–	555/–
26	6	...	505/–	531/–	558/–	585/–	646/–	661/–
26	7	...	587/–	617/–	648/–	679/–	750/–	768/–
26	8	...	665/–	700/–	735/–	770/–	851/–	872/–
28	4	...	390/–	414/–	432/–	449/–	468/–	486/–
28	5	...	480/–	510/–	532/–	555/–	577/–	599/–
28	6	...	577/–	613/–	639/–	666/–	692/–	719/–
28	7	...	670/–	713/–	743/–	773/–	804/–	835/–
28	8	...	761/–	808/–	843/–	878/–	913/–	949/–
30	4	...	437/–	460/–	484/–	508/–	526/–	544/–
30	5	...	538/–	566/–	595/–	625/–	648/–	670/–
30	6	...	642/–	675/–	711/–	747/–	774/–	800/–
30	7	...	745/–	784/–	827/–	869/–	899/–	930/–
30	8	...	851/–	895/–	942/–	989/–	1024/–	1059/–

RULES FOR CALCULATING LIST PRICES.

A cylinder wheel is one 8″ or more outside diameter, 4″ or more in height, with a hole not less than 6″ in diameter, rim thickness not exceeding 4″ and without inside projections.

A wheel of this type with inside projections is a cup wheel.

Cylinders with diameters intermediate to those shown in the list take the list of the next larger diameter.

Cylinders with heights intermediate to those shown in the list take the list of the next higher diameter.

Cylinders with rim thicknesses intermediate to those shown in list take the list of the next thicker rim.

Rims.—A cylinder with outside projections, or with a tapered rim, takes the list price of the maximum diameter and the maximum thickness of rim.

Heights.—Cylinders more than 8″ in height are figured proportionately to the 8″ height for any listed diameter.

Heights of cylinders increase by 1″ from 8″, and intermediate heights take the list price of the next higher inch.

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GRINDING WHEELS.

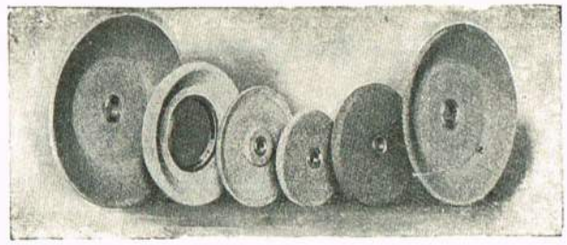
CUP  WHEELS.

Fig. 1787.

General Price List. Subject to Discount.

		Thickness of Rim and Back, inches.							
ia.	Ht.	1	1½	2	2½	3	3½	4	Back.
	4″	52/6	—	—	—	—	—	—	—
	5″	75/–	—	—	—	—	—	—	—
	6″	77/–	—	—	—	—	—	—	—
	7″	89/–	—	—	—	—	—	—	—
	8″	101/–	—	—	—	—	—	—	—
ıck per ¼″		6d.	—	—	—	—	—	—	—
	4″	68/–	70/–	—	—	—	—	—	—
	5″	83/–	86/–	—	—	—	—	—	—
	6″	99/–	102/6	—	—	—	—	—	—
	7″	114/6	118/6	—	—	—	—	—	—
	8″	130/–	134/–	—	—	—	—	—	—
ıck per ¼″		6d.	6d.	—	—	—	—	—	—
	4″	82/–	85/–	87/6	—	—	—	—	—
	5″	102/–	105/–	107/6	—	—	—	—	—
″	6″	120/6	124/6	128/–	—	—	—	—	—
	7″	139/–	144/–	148/–	—	—	—	—	—
	8″	158/–	163/6	168/–	—	—	—	—	—
ıck per ¼″		6d.	6d.	6d.	—	—	—	—	—
	4″	104/–	112/–	115/6	118/–	119/–	—	—	—
	5″	128/–	138/–	142/–	145/–	147/–	—	—	—
″	6″	152/–	163/–	168/6	172/–	174/6	—	—	—
	7″	175/–	189/–	195/–	198/6	202/–	—	—	—
	8″	198/6	213/6	220/–	225/–	229/–	—	—	—
ıck per ¼″		1/6	1/–	6d.	6d.	6d.	—	—	—
	4″	143/–	148/6	153/6	159/6	160/6	161/6	162/6	2½″
	5″	174/6	181/–	187/–	195/6	198/6	201/–	202/–	3½″
″	6″	206/6	214/–	221/–	231/–	235/–	238/–	240/–	—
	7″	238/–	247/–	255/–	267/–	272/–	275/–	278/–	—
	8″	270/6	280/–	289/–	302/6	308/–	312/6	315/6	—
ıck per ¼″		2/–	1/6	1/6	1/–	6d.	6d.	6d.	—
	4″	178/–	186/6	194/–	198/6	200/–	203/–	204/6	2½″
	5″	218/–	227/6	236/–	242/–	247/–	253/–	254/–	3½″
″	6″	257/6	269/–	278/–	285/–	291/–	299/–	302/–	—
	7″	297/6	310/–	321/–	329/–	336/–	345/6	349/–	—
	8″	337/6	351/–	363/6	372/–	380/–	391/6	397/–	—
ıck per ¼″		2/6	2/3	2/–	1/6	1/6	1/–	6d.	—
	4″	216/–	226/–	235/–	242/–	244/–	245/6	247/–	2½″
	5″	265/–	276/–	286/–	294/–	301/–	306/–	308/–	3½″
″″	6″	313/–	326/–	336/–	346/–	355/–	361/–	366/–	—
	7″	362/–	375/–	388/–	399/–	408/–	415/–	421/–	—
	8″	410/–	425/–	439/–	451/–	462/–	470/–	477/–	—
ck per ¼″		3/3	2/9	2/6	2/3	2/–	1/6	1/6	—

		Thickness of rim and back, inches.						
Dia.	Ht.	1	1¼	1½	1¾	2	2¼	2½
	4″	260/–	266/–	271/–	276/–	282/–	286/–	290/–
	5″	319/–	325/–	331/–	337/–	343/–	348/–	353/–
20″	6″	377/–	384/–	391/–	398/–	404/–	409/–	415/–
	7″	435/–	443/–	451/–	458/–	465/–	471/–	477/–
	8″	494/–	502/–	510/–	518/–	526/–	533/–	540/–
Back per ¼″		3/9	3/6	3/6	3/6	3/3	3/–	2/9
	4″	320/–	329/–	335/–	341/–	347/–	352/–	357/–
	5″	392/–	402/–	409/–	416/–	423/–	429/–	434/–
22″	6″	463/–	476/–	484/–	491/–	499/–	505/–	511/–
	7″	532/–	549/–	557/–	566/–	574/–	581/–	588/–
	8″	604/–	622/–	631/–	641/–	649/–	657/–	665/–
Back per ¼″		7/3	4/3	4/3	4/–	3/9	3/6	3/6
	4″	336/–	349/–	362/–	375/–	386/–	417/–	423/–
	5″	410/–	425/–	440/–	454/–	467/–	510/–	516/–
24″	6″	480/–	497/–	514/–	530/–	545/–	599/–	606/–
	7″	550/–	569/–	587/–	605/–	622/–	688/–	696/–
	8″	623/–	644/–	664/–	683/–	702/–	780/–	788/–
Back per ¼″		9/–	8/9	8/–	7/9	7/3	4/3	4/3
	4″	—	—	441/–	454/–	468/–	480/–	492/–
	5″	—	—	533/–	549/–	564/–	578/–	591/–
26″	6″	—	—	626/–	643/–	660/–	675/–	690/–
	7″	—	—	717/–	736/–	755/–	772/–	789/–
	8″	—	—	806/–	826/–	847/–	865/–	884/–
Back per ¼″		—	—	10/–	9/6	9/–	8/9	8/–
	4″	—	—	512/–	527/–	543/–	556/–	570/–
	4″	—	—	614/–	633/–	651/–	666/–	681/–
28″	6″	—	—	722/–	744/–	765/–	782/–	799/–
	7″	—	—	827/–	852/–	875/–	895/–	913/–
	8″	—	—	930/–	957/–	982/–	1004/–	1023/–
Back per ¼″		—	—	11/9	11/3	10/9	10/3	10/–
	4″	—	—	580/–	601/–	622/–	637/–	652/–
	5″	—	—	696/–	719/–	740/–	759/–	777/–
30″	6″	—	—	815/–	839/–	861/–	884/–	904/–
	7″	—	—	933/–	959/–	984/–	1009/–	1032/–
	8″	—	—	1050/–	1080/–	1106/–	1134/–	1159/–
Back per ¼″		—	—	14/3	13/9	13/3	12/6	11/9

A cup wheel is one 8″ or more outside diameter, 4″ or more in height, with an inside cup diameter of not less than 6″ and an inside cup depth of not less than 1½″, with a rim and back thickness not exceeding 4″.

Cups with outside projections, or tapered rims, take the list of the maximum diameter and maximum thickness of rim.

The back of a cup wheel is represented by any projection inside the cup, whether it is in the form of a small shoulder, raised dovetail or complete back.

Cup wheels with diameters intermediate to those shown in list take the list of the next larger diameter.

Cup wheels with heights intermediate to those shown in the list take the list of the next higher cup.

Cup wheels with rim thicknesses intermediate to those shown in the list take the list of the next thicker rim.

Cup wheels more than 8″ in height are figured proportionately to the 8″ height for any listed diameter. Heights of cups to increase by inches from 8″, and the intermediate heights to take the list of the next higher inch.

Backs.—A price per inch or fractional part of an inch is shown. "Back per ¼ inch," for calculating the list price of a cup wheel with back and rim of different thickness.

Cup wheels with backs varying in thickness from that of their rims to the extent of fractional parts of quarter inches take the list of the next higher thickness.

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OIL STONES.

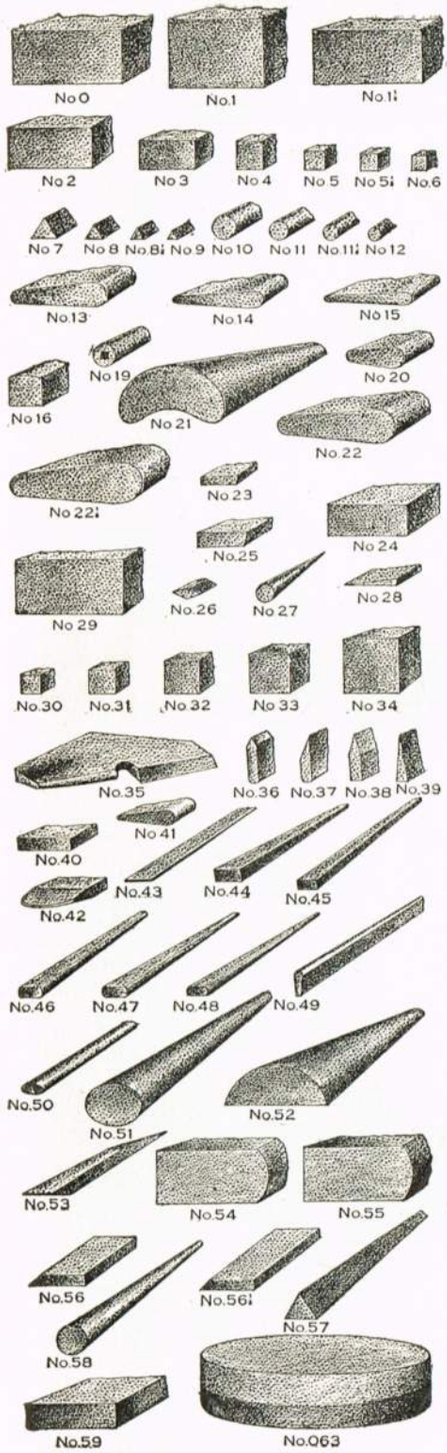

Fig. 1788. INDIA OIL STONES.

Are the best and most popular artificial sharpening stones produced. They cut rapidly and wear regularly, and are for quick sharpening of all mechanics' tools.

COARSE, MEDIUM OR FINE GRITS.

Shape	Dimensions	Price each
00	$9 \times 2 \times 1$	**9/5**
01	$9 \times 1\frac{3}{4} \times 1\frac{1}{4}$	**10/5**
0	$8 \times 2 \times 1$	**6/3**
0	$8 \times 2 \times 1$ combination ...	**8/4**
1	$8 \times 1\frac{3}{4} \times 1\frac{1}{4}$	**7/4**
1	$8 \times 1\frac{3}{4} \times 1\frac{1}{4}$ combination ...	**9/5**
$1\frac{1}{2}$	$7 \times 2 \times 1$	**5/3**
$1\frac{1}{2}$	$7 \times 2 \times 1$ combination ...	**7/4**
2	$6 \times 1\frac{5}{8} \times \frac{3}{4}$	**4/2**
2	$6 \times 1\frac{5}{8} \times \frac{3}{4}$ combination ...	**5/8**
3	$4 \times 1 \times \frac{1}{2}$	**2/6**
3	$4 \times 1 \times \frac{1}{2}$ combination ...	**3/7**
4	Square file $4 \times \frac{1}{2}$	**2/1**
5	Square file $4 \times \frac{3}{8}$	**2/1**
$5\frac{1}{2}$	Square file $4 \times {}^{5}/_{16}$ ...	**2/1**
6	Square file $4 \times \frac{1}{4}$	**2/1**
7	Triangular file $4 \times \frac{1}{2}$ ...	**2/9**
8	Triangular file $4 \times \frac{3}{8}$ ...	**2/9**
$8\frac{1}{2}$	Triangular file $4 \times {}^{5}/_{16}$ ...	**2/9**
9	Triangular file $4 \times \frac{1}{4}$ ...	**2/9**
10	Round file $4 \times \frac{1}{2}$	**2/11**
11	Round file $4 \times \frac{3}{8}$	**2/11**
$11\frac{1}{2}$	Round file $4 \times {}^{5}/_{16}$	**2/11**
12	Round file $4 \times \frac{1}{4}$	**2/11**
13	$4\frac{1}{2} \times 1\frac{3}{4} \times \frac{1}{2} \times {}^{3}/_{16}$	**2/9**
14	$4\frac{1}{2} \times 1\frac{3}{4} \times \frac{3}{8} \times \frac{1}{8}$	**2/9**
15	$4\frac{1}{2} \times 1\frac{3}{4} \times \frac{1}{4} \times {}^{1}/_{16}$	**2/9**
16	$8 \times \frac{5}{8} \times \frac{5}{8}$	**4/2**
19	Engravers' pencils (fine one end medium the other)...	**2/9**
20	$4 \times 1 \times {}^{7}/_{16} \times {}^{3}/_{16}$	**2/1**
*21	$6 \times 2 \times 1 \times \frac{3}{8} \times {}^{3}/_{16}$	**6/3**
22	$4\frac{1}{2} \times 2\frac{1}{8} \times \frac{5}{8} \times {}^{5}/_{16}$	**4/2**
$22\frac{1}{2}$	$6 \times 2\frac{1}{4} \times \frac{3}{4} \times \frac{3}{8}$	**5/3**
23	$3\frac{1}{2} \times \frac{3}{4} \times {}^{3}/_{16} \times \frac{1}{8}$	**1/8**
24	$4\frac{1}{2} \times 1\frac{1}{2} \times \frac{5}{8}$	**3/2**
24	$4\frac{1}{2} \times 1\frac{1}{2} \times \frac{5}{8}$ combination ...	**4/2**
25	$4\frac{1}{2} \times 1 \times {}^{5}/_{16}$ reamer stone	**1/8**
26	$4 \times {}^{9}/_{16} \times {}^{3}/_{16}$	**3/9**
27	$3 \times {}^{5}/_{16}$ points	**3/9**
28	$4 \times 1 \times \frac{1}{8}$	**2/11**
29	$6 \times 2 \times 1$	**4/10**
29	$6 \times 2 \times 1$ combination ...	**6/3**
30	Square file $6 \times \frac{3}{8}$	**2/11**
31	Square file $6 \times \frac{1}{2}$	**2/11**
32	Square file $6 \times \frac{5}{8}$	**2/11**
33	Square file $6 \times \frac{3}{4}$	**3/7**
34	Square file 6×1	**3/7**
35	Bath universal slip ...	**10/5**
36, 37, 38, 39	1 set (4) carvers' slips $2\frac{1}{4} \times \frac{7}{8} \times {}^{3}/_{16}$	**8/4**
40	$2 \times 1 \times \frac{1}{4}$	**1/6**
41	$5 \times 1 \times {}^{5}/_{16} \times {}^{3}/_{32}$	**2/1**
42	$4 \times 1 \times \frac{1}{4}$	**2/9**
43	$4 \times \frac{1}{2} \times {}^{1}/_{16}$	**3/2**
44	$4 \times \frac{1}{2} \times \frac{1}{4} \times {}^{5}/_{16} \times \frac{1}{8}$	**3/2**
45	$4 \times {}^{5}/_{16} \times {}^{3}/_{16} \times {}^{5}/_{16} \times {}^{1}/_{16}$ ...	**3/2**
46	$4 \times \frac{1}{2} \times \frac{1}{4} \times {}^{5}/_{16} \times \frac{1}{8}$	**3/2**
47	$4 \times \frac{1}{2} \times {}^{3}/_{16} \times {}^{3}/_{16} \times {}^{1}/_{16}$ ...	**3/2**
48	$4 \times \frac{3}{8} \times {}^{3}/_{16} \times \frac{1}{8} \times {}^{1}/_{16}$ ...	**3/2**
49	$4 \times {}^{7}/_{16} \times {}^{3}/_{16} \times \frac{1}{8}$	**3/2**
50	$3\frac{1}{2} \times {}^{7}/_{16} \times {}^{3}/_{16}$	**3/2**
51	Oval plug $6 \times \frac{7}{8} \times {}^{5}/_{16}$ ...	**4/7**
†52	Heel breast, stone $6 \times 2 \times \frac{3}{8}$	**2/11**
53	Automobile stone	**2/9**
53	Automobile stone in case	**3/2**
54	$8 \times 2 \times \frac{3}{4}$ High round ...	**6/3**
$54\frac{1}{2}$	$5 \times 1\frac{1}{2} \times \frac{1}{2}$ High round ...	**4/2**
55	$4 \times 1\frac{1}{2} \times \frac{1}{2}$ High round ...	**3/9**
56	$5 \times 1 \times {}^{3}/_{16}$ (reamer stone)	**2/1**
$56\frac{1}{2}$	$6 \times 1 \times \frac{1}{4}$ (reamer stone) ...	**3/2**
57	$4 \times \frac{1}{2} \times \frac{1}{4}$	**3/2**
58	$4 \times \frac{1}{2} \times \frac{1}{4}$	**3/2**
59	$3 \times 1\frac{1}{2} \times \frac{1}{2}$ Axe stone, coarse grit only	**1/11**
60	Circular axe stone $3 \times \frac{5}{8}$ ...	**3/2**
61	$3\frac{1}{2} \times 1 \times \frac{3}{8}$	**–/10**
62	Sportsmen's stone $3 \times 1\frac{3}{8} \times \frac{1}{2}$	**4/2**
63	Circular comb 4×1 ...	**6/11**
63	Above in steel box ...	**11/1**
64	Triangular file $6 \times \frac{1}{2}$ ...	**3/7**
65	Triangular file $6 \times \frac{5}{8}$ ...	**4/–**
66	Triangular file $6 \times \frac{3}{4}$ ...	**4/–**
67	Triangular file 6×1 ...	**4/7**
	Engravers' chuck	**5/3**
	Points $1 \times \frac{1}{8}$ per dozen ...	**6/1**
68	$4\frac{1}{2} \times \frac{3}{4} \times {}^{5}/_{16}$	**1/6**
	Wood boxes (each list) ...	**1/8**
	Iron boxes (each list) ...	**3/2**

* No. 21 made in special fine only. † No. 52 made in medium fine only.
Shapes 0, 1, $1\frac{1}{2}$, 2, 3, 29 can be furnished in wood cases at **1/8** each extra.
Shapes 0, $1\frac{1}{2}$, 2, 29 in iron boxes, **3/2** each extra.

INDIA COMBINATION OIL STONES.

One side medium and one side coarse.

Shape	Dimensions—inches	Price each
0	$8 \times 2 \times 1$	**8/4**
1	$8 \times 1\frac{3}{4} \times 1\frac{1}{4}$	**9/5**
$1\frac{1}{2}$	$7 \times 2 \times 1$	**7/4**
2	$6 \times 1\frac{5}{8} \times \frac{3}{4}$	**5/8**
3	$4 \times 1 \times \frac{1}{2}$	**3/7**
24	$4\frac{1}{2} \times 1\frac{1}{2} \times \frac{5}{8}$	**4/2**
29	$6 \times 2 \times 1$	**6/3**

INDIA OIL STONE WHEELS.

Diameter inches	Thickness of wheels—inches $\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	Diameter inches	Thickness of wheels—inches $\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2
1	**3/2**	**3/9**	**4/5**	**5/–**	**6/3**	**7/6**	5	**11/3**	**13/9**	**16/3**	**18/9**	**21/3**	**24/5**
$1\frac{1}{2}$	**3/9**	**5/–**	**5/8**	**6/3**	**7/6**	**8/9**	6	**13/2**	**15/8**	**18/2**	**20/–**	**28/9**	**36/11**
2	**4/8**	**6/3**	**7/6**	**8/9**	**10/–**	**11/3**	7	—	**20/3**	**25/–**	**29/8**	**35/11**	**47/6**
$2\frac{1}{2}$	**5/–**	**7/6**	**8/9**	**10/–**	**11/3**	**13/2**	8	—	**24/5**	**28/2**	**35/–**	**43/9**	**56/3**
3	**6/3**	**8/9**	**10/8**	**12/6**	**14/5**	**15/8**	9	—	**28/9**	**33/6**	**42/2**	**55/8**	**75/–**
$3\frac{1}{2}$	**7/6**	**10/–**	**12/6**	**15/–**	**17/2**	**18/9**	10	—	**34/5**	**39/–**	**48/5**	**65/–**	**77/6**
4	**8/9**	**11/3**	**13/9**	**16/3**	**18/9**	**21/3**	12	—	**43/9**	**53/2**	**68/9**	**93/9**	**109/5**
$4\frac{1}{2}$	**10/–**	**12/6**	**15/–**	**17/6**	**20/–**	**23/2**							

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POLISHING MOPS.

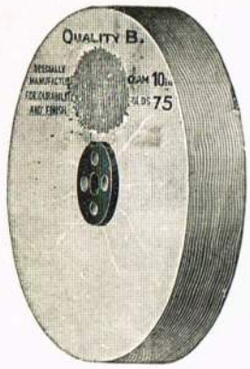

Fig. 1790. Quality B. Brown Unbleached Mops.

For general service and for finishing brass and copper.

Quality H. White Bleached Non-Flying Mops.

For roughing and grease mopping. Even-wearing and fast-cutting.

PRICES AND DIMENSIONS.

B QUALITY.

Diameter	ins.	6	6	6	8	8	8
No. of folds	....	25	50	75	25	50	75
Price	doz.	**16/6**	**30/–**	**41/6**	**26/6**	**48/–**	**68/6**
Diameter	ins.	10	10	10	12	12	12
No. of folds	....	50	75	100	50	75	100
Price	doz.	**72/6**	**105/–**	**138/–**	**104/–**	**152/–**	**204/–**

H QUALITY.

Diameter ins.	6	6	6	6	8	8	8
No. of folds	50	75	00	140	50	105	130
Price doz.	**23/6**	**33/6**	**44/6**	**59/–**	**38/–**	**74/6**	**89/–**
Diameter ins.	8	10	10	10	12	12	12
No. of folds	140	105	140	210	105	140	210
Price doz.	**95/–**	**110/6**	**145/6**	**211/–**	**161/–**	**215/6**	**323/–**

50 folds equals approximately 1 inch.

Fig. 1791. Felt Polishing Bobs and in Sheets.

Made in Medium Grade and Soft Grade. The former is useful for emery bobbing cast iron, tools, etc., and Soft Grade for finishing brass, copper, nickel, ivory, etc.

Sizes	6×1	6×1½	8×1	8×1½	8×2	9×1	9×1½
Weight per doz. approx.	7	10½	13	19½	26	17	25½
Sizes	9×2	10×1	10×1½	10×2	12×1	12×1½	12×2
Weight per doz. approx.	34	22	33	44	30	45	60

Price, Soft or Medium .... **10/3** per lb.

For Felt in Sheets up to 66 ins. long, width 32 ins., and 2 ins. thick, Prices on application.

"RADIANT" WHITE FINISH.

LUSTRE POLISH.

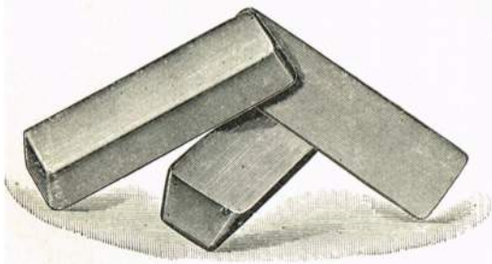

Fig. 1792.. Highest grade Tripoli Polish.
Suitable for all-round requirements. Economical in use. Uniform quality.
14/– per doz. bars.

Fig. 1793.
Superfine Finishing Composition, giving a perfect polish.
Packed in air-tight tins.
27/– per doz. tins.

B.H. ROUGE COMPOSITION.

Fig. 1794.

For finishing silver, brass, nickel silver, solid nickel, copper and jewellery.

2/6 per lb.

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WIRE BRUSHES.

These scraping and cleaning foundry brushes are the finest quality only. The wood stocks are stout and well finished, fitted with best quality hardened and tempered steel wire securely fixed. For use in Foundries, Engineering Works, Motor Works, Shipyards, Mines, etc.

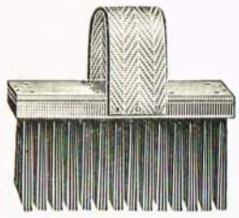

Fig. 1795. With Webbing Handle and Flat Wires.

With 3″ Wires.
Size 7″ x 2½″. 10 x 5 rows.
Price **12**/– doz.

Fig. 1796. Same as Fig. 1795 but with Wood Handle.

With 3″ Wires.
Size 7″ x 2½″. 10 x 5 rows.
12 inches overall.
Price **12/6** doz.

Fig. 1797. Fitted with sheet iron back, slightly curved handle.

With 1½″ wire.
Size 6½″ x 1½″. 14 x 4 rows.
Price **18**/– doz.

Size 6½″ x 2″. 14 x 6 rows.
Price **24**/– doz.

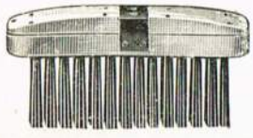

Fig. 1798. Flat Wires.

Dimensions of Stock 8″ x 2¾″
No. of Rows ... ... 15 x 5
Length of Wires ... ... 2½″

Price per dozen **13/9.**

Fig. 1799. Steel Flat Wire Brooms.

3″ Wires.
Size 9″ x 3″. 16 x 6 rows.
Price **21/6** doz.

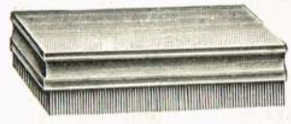

Fig. 1800. Fire Card Brush.

Dimensions of stock 5″ x 2″.
Price **4**/– per doz.

Fig. 1801. Reliance Steel Wire Brushes.

These Brushes are made in sections firmly secured together on a bush by clamping plate and nut. Can be supplied with medium or heavy wire.

Size ...	A	B	C	D	E
Dia. ins.	6 x 1⅛	8 x 1½	10 x 1¾	12 x 2	15 x 2½
Bore ins.	¾	1	1½	1½	1¾
No. of Sections	5	5	6	7	8
Price ea.	**32**/–	**42**/–	**60**/–	**70**/–	**100**/–
,, Refills per set	**10/6**	**13/6**	**21**/–	**28/6**	**34/6**

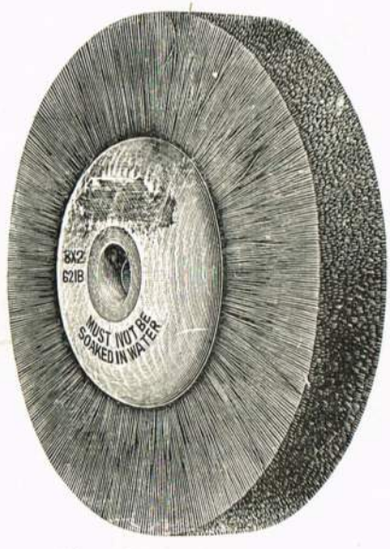

Fig. 1802. Polishing Brushes for use with emery compound for iron, steel and brass. Must not be used soaked in water. 5″ dia. flanges.

Sizes	621A.	621C.	596C.
	5/6	**7/6**	**5**/–

Fig. 1803. Specially for use with circular Brushes. Made from finest emery, being put in bars of convenient forms vastly superior to old-fashioned emery and oil

1/2 Bar. **12**/– Doz. Bars.

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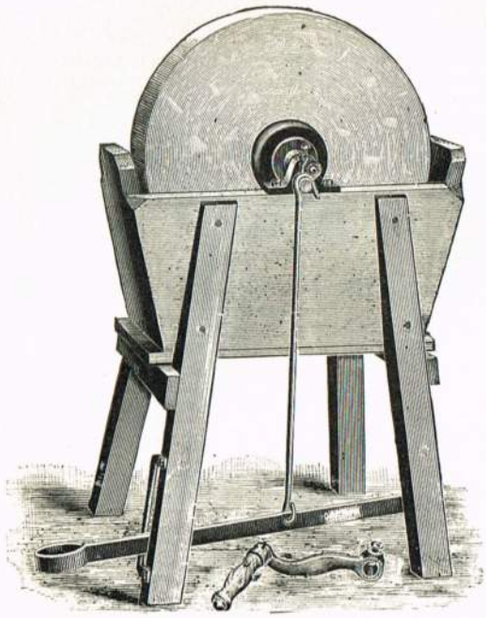
GRINDSTONES.



Fitted with Handle and Treadle, and Wood Plug at bottom of trough, to let water off. The Stones are fitted with strong turned wrought-iron Spindles, and secured by Side Plates and Lock Nuts.

Fig. 1810.

The "SURPRISE" is a strong serviceable article adapted for Amateurs, Butchers and Agricultural Purposes.

Size of Stone, in inches.	No. E3010. With Ordinary Bearings. s. d.	No. E3011. With Improved Roller Bearings. s. d.
14 × 3 ...	41 0 each. ...	45 0 each.
16 × 3 ...	43 0 ,, ...	47 0 ,,
18 × 3 ...	45 0 ,, ...	49 0 ,,
20 × 3 ...	52 0 ,, ...	56 0 ,,
22 × 3½ ...	59 0 ,, ...	63 0 ,,
24 × 3½ ...	70 0 ,, ...	74 0 ,,
30 × 4 ...	120 0 ,, ...	120 0 ,,
36 × 4 ...	160 0 ,, ...	160 0 ,,

EXTRAS.

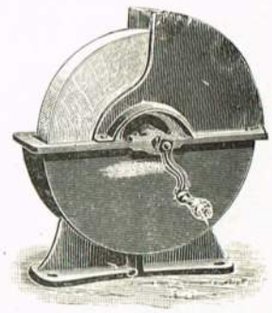
	Sizes, to 20	22 to 30	36 inch.
With Water Can and Tap	4/-	5/-	6/-
Supporting Rod for Water Can, required with Grindstone without Hood...	2/6	3/-	3/-
With Fast Pulley only, instead of Treadle	2/6	3/-	3/-
With Fast and Loose Pulleys, instead of Treadle	9/-	11/-	13/-

Fig. 1811. WITHOUT HOOD.

Best Grindstones

MOUNTED IN IRON TROUGH

Fig. 1812. WITH HOOD.



Sizes and Prices
With Ordinary Bearings.

Size of Stone, in inches.	Each. s. d.
6 × 1½	8 0
8 × 1½	10 6
10 × 2	13 0
12 × 2	16 0
14 × 2½	19 0
16 × 3	24 0
18 × 3	33 6
20 × 3	43 0
24 × 3½	65 0

Turned Wrought Iron Spindles

Stones secured by side plates and lock nuts

Sizes and Prizes
With Ordinary Bearings.

Size of Stone, in inches.	Each. s. d.
6 × 1½	10 0
8 × 1½	13 0
10 × 2	15 6
12 × 2	19 0
14 × 2½	22 6
16 × 3	28 0
18 × 3	40 0
20 × 3	51 0
24 × 3½	76 0

EXTRAS.

	10 to 14in.	16 to 20in.	24in.
Fitted with Water Can and Tap	4/-	4/-	5/-
Supporting Rod for Water Can, required with Grindstone without Hood	2/6	2/6	3/-
If fitted with Fast Pulley only or Grooved Pulley	9/-	10/-	10/-
If fitted with Fast and Loose Pulleys	15/-	17/6	17/6

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GRINDSTONES.

Fitted with Plummer Block Bearings with Best Brasses, Fast and Loose Pulleys; and Adjustable Tool Rest and Handle.

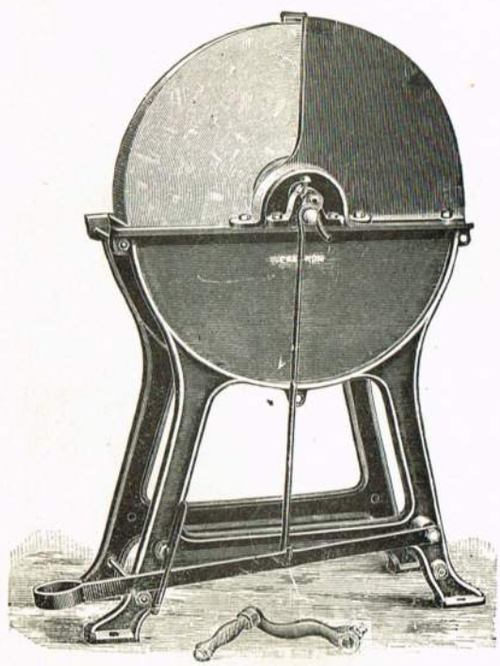
Fig. 1813.

This represents the most up-to-date pattern embodying all the most modern improvements, fitted with extra strong turned wrought-iron spindles. Stone secured with plates and lock nuts. Troughs painted two coats, fitted with adjustable tool rest.

Sizes of Stone, in inches.	No. 3058 Without Hood.	No. 3054 With Hood.
24 × 3½	124 0 each.	137 0 each.
24 × 4	128 0 ,,	141 0 ,,
30 × 4	158 0 ,,	176 0 ,,
30 × 5	170 0 ,,	188 0 ,,
36 × 4	214 0 ,,	236 0 ,,
36 × 5	230 0 ,,	252 0 ,,
36 × 6	253 0 ,,	277 0 ,,
36 × 7	269 0 ,,	293 0 ,,
36 × 8	292 0 ,,	318 0 ,,
42 × 5	315 0 ,,	358 0 ,,
42 × 6	335 0 ,,	378 0 ,,
42 × 7	364 0 ,,	412 0 ,,
42 × 8	384 0 ,,	432 0 ,,
48 × 6	407 0 ,,	467 0 ,,
48 × 7	433 0 ,,	493 0 ,,
48 × 8	468 0 ,,	536 0 ,,
48 × 9	494 0 ,,	562 0 ,,
48 × 10	520 0 ,,	588 0 ,,

EXTRAS.

	Sizes 24 & 30	36	42 & 48 inch. diam.
If with Striking Gear	15/6	15/6	20/-
If with Water Can and Tap	5/-	6/-	6/-
If with Supporting Rod for Water Can, required with Grindstones without Hood	3/-	3/-	3/-



This stone is also fitted with turned wrought iron spindles. Stone secured with plates and lock nuts. Supplied handle and treadle, and screwed draining plug.

Fig. 1814. WITHOUT HOOD.

Size of Stone, in inches.	No. 3031 Plain Bearings.	No. 3032 Roller Bearings.
16 × 3	50 0 each.	54 0 each.
18 × 3	55 0 ,,	59 0 ,,
20 × 3	60 0 ,,	64 0 ,,
22 × 3½	68 0 ,,	72 0 ,,
24 × 3½	75 0 ,,	79 0 ,,
24 × 4	79 0 ,,	83 0 ,,

WITH HOOD.

Size of Stone, in inches.	No. 3033 Plain Bearings.	No. 3034 Roller Bearings.
16 × 3	57 0 each.	61 0 each.
18 × 3	62 6 ,,	66 6 ,,
20 × 3	68 0 ,,	72 0 ,,
22 × 3½	77 0 ,,	81 0 ,,
24 × 3½	85 0 ,,	89 0 ,,
24 × 4	89 0 ,,	93 0 ,,

EXTRAS.

	Sizes, to 20ins.	22 to 24ins.
Fitted with Water Can and Tap	4/-	5/-
Supporting Rod for Water Can, required with Grindstones without Hood	2/6	3/-
No. **3031** or **3033** fitted with Fast Pulley only, instead of Treadle	2/6	3/-
,, ,, ,, ,, Fast and Loose Pulleys instead of Treadle	9/-	11/-

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POLISHING AND GRINDING HEADS.

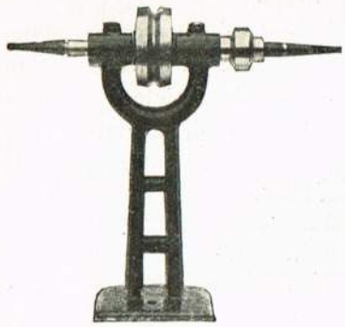

Fig. 1815. Double Polishing Head. Adjustable bearings, brass oil cup, fitted with two screw collars for abrasive wheels. Right hand side taper drilled to take small drills. Black and red stove enamelled.

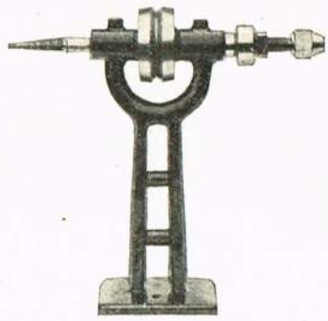

Fig. 1816. Polishing Taper Spindle, fitted with pin chuck opposite for small drills and collars for abrasive wheels. Split bearings and brass oil cups. Black and red stove enamelled.

Fig. 1817. Polishing Taper Spindle, fitted with three-jaw drill chuck opposite to take drills up to $^3/_{16}''$ diameter. Black and red stove enamelled.

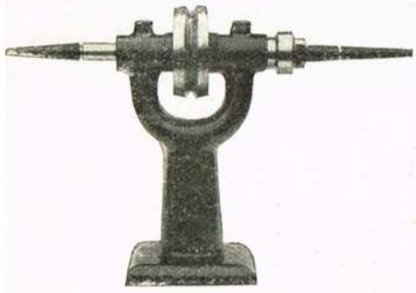

Fig. 1818. Double Polishing Head, similar to **Fig. 1815,** only of heavier proportions. Black and red stove enamelled.

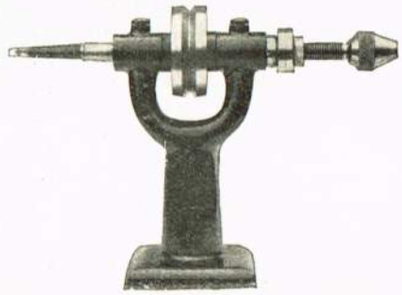

Fig. 1819. Polishing Taper Spindle and fitted with pin chuck opposite, heavier proportions than **Fig. 1816.** Black and red stove enamelled.

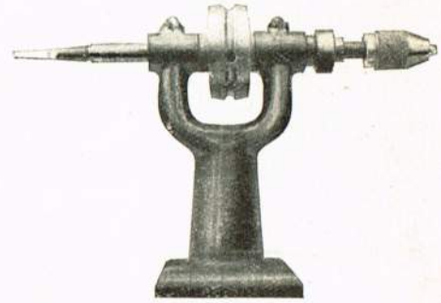

Fig. 1820. Polishing Taper Spindle and fitted with 3-jaw drill chuck to take up to $\frac{1}{4}''$ drills. Heavier proportions than **Fig. 1817.** Black and red stove enamelled.

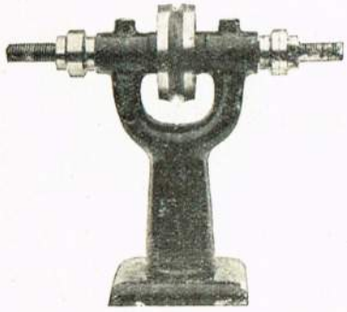

Fig. 1821. Double Grinding Head only, fitted with flanges to take abrasive wheels both ends. Of ample dimensions for small work, jewellers, etc. Black and red stove enamelled.

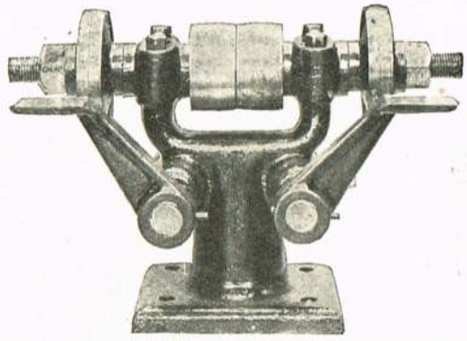

Fig. 1822. Double Power Grinding Head, fitted with tool rests, fast and loose pulley, large diameter flanges, lock-nuts and spring washers, split adjustable bearings. Black and red stove enamelled.

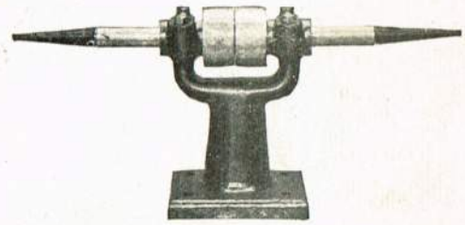

Fig. 1823. Double Power Polishing Heads fast and loose pulleys, split bearings. **Fig. 1824.** Same dimensions, with fast and loose pulleys, as **Fig. 1823,** but made as **Fig. 1820,** fitted with $\frac{1}{2}''$ 3-jaw drill chuck.

DIMENSIONS AND PRICES.

Fig. No.	Height to centre of spindle ins.	Length of spindle ins.	Diam. of spindle ins.	Diam. of pulley ins.	Diam. of belting ins.	Thickness of Abrasive wheel taken ins.	Weight lbs.	Price each
815	 6	$7\frac{3}{4}$	$\frac{3}{8}$	$1\frac{3}{4}$	$^3/_{16}$	$\frac{5}{8}$	$2\frac{1}{4}$	**5/10**
816	 6	$7\frac{1}{2}$	$\frac{3}{8}$	$1\frac{3}{4}$	$^3/_{16}$	$\frac{5}{8}$	$2\frac{3}{4}$	**6/8**
817	 6	$8\frac{1}{4}$	$\frac{3}{8}$	$1\frac{3}{4}$	$^3/_{16}$	$\frac{5}{8}$	$2\frac{1}{2}$	**9/9**
818	.... $5\frac{1}{2}$	10	$\frac{1}{2}$	$2\frac{1}{4}$	$\frac{1}{4}$	1	4	**7/3**
819	.... $5\frac{1}{2}$	10	$\frac{1}{2}$	$2\frac{1}{4}$	$\frac{1}{4}$	1	4	**8/3**
820	.... $5\frac{1}{2}$	10	$\frac{1}{2}$	$2\frac{1}{4}$	$\frac{1}{4}$	1	4	**11/3**
821	.... $5\frac{1}{2}$	$7\frac{3}{4}$	$\frac{1}{2}$	$2\frac{1}{4}$	$\frac{1}{4}$	1	$5\frac{1}{2}$	**8/–**
822	 6	11	$\frac{3}{4}$	$2\frac{1}{4}$	1 flat	8 diam. × $1\frac{1}{4}$	$14\frac{1}{2}$	**40/–**
823	 6	16	$\frac{3}{4}$	$2\frac{1}{4}$	1 flat	—	$9\frac{1}{4}$	**24/–**
824	 6	16	$\frac{3}{4}$	$2\frac{1}{4}$	1 flat	1	$9\frac{1}{4}$	**40/–**

Fig. 1822A same as **Fig. 1822,** but fitted with a $6'' \times \frac{3}{4}$ and $8'' \times \frac{1}{2}$ abrasive wheels .... **50/–** each.

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EMERY GRINDERS AND STONES.

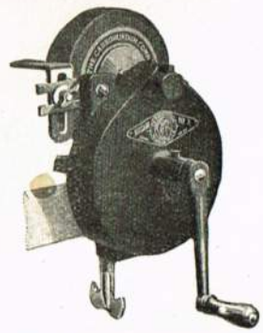

Fig. 1830. NIAGARA GRINDERS.

Made in four sizes. Fitted with Carborundum wheels.

Diameter of wheel, inches ...	4	5	6	7½
Thickness of wheel, inches ...	1	1	1	1¼
Arbor hole, inches	⅜	⅜	⅜	1½
Price each	**27/–**	**35/–**	**45/–**	**65/–**

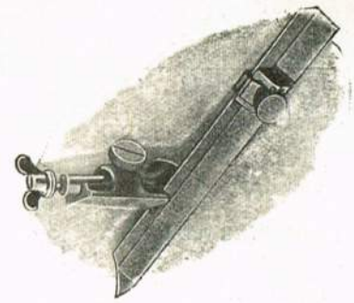

Fig. 1831. TWIST DRILL ATTACHMENT for Niagara Grinders.

Suitable for 6″ and 7½″ grinders.
Price ... **16/6** each.

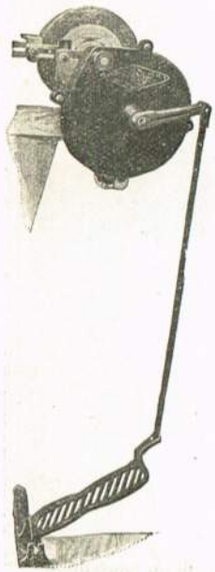

Fig. 1832. FOOT POWER ATTACHMENT

can be fitted to Niagara grinders.

The attachment is simple yet powerful; is made of malleable iron, strong and durable; easily adjusted to several heights.

Size 6″.
Price **14/–** each.

Size 7½″.
Price **14/–** each.

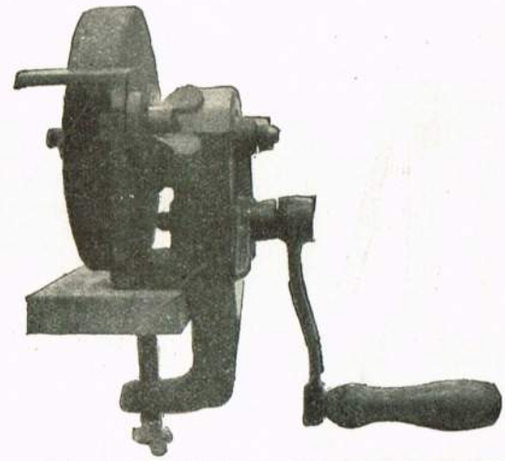

Fig. 1833. A CHEAP AND EFFICIENT GRINDER.

Supplied in three sizes, with good quality wheels. Tool rest and stove enamelled.

Diameter of wheel, inches ..	4	5	6	7
Weight, lbs.	5½	6½	7	
Price each	**11/-**	**12/9**	**15/9**	**24/6**

Fig. 1834. CARBORUNDUM AND ALOXITE GRAINS AND POWDERS.

Large, **2/–** per tin; medium, **1/–** per tin; small, **6d.** per tin.

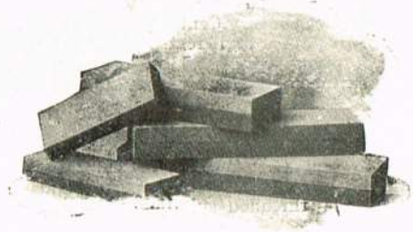

Fig. 1835. CARBORUNDUM AND ALOXITE COMBINATION STONES.

are made in eight sizes. Specially constructed for mechanics and carpenters. One face is coarse and the other very fine grit. The coarse side is for sharpening dull tools, and the fine side for putting the necessary keen edge.

Nos. ...	108	109	110	111	112	328	329	333
Size, inches	8×2×1	6=2×1	7×2×1	5×2×¾	4×1¾×⅝	8×3×1	8×3×1½	12×2½×1
Price each	**7/3**	**5/3**	**6/3**	**4/3**	**3/6**	**9/6**	**13/6**	**12/6**

Fig. 1836. CARBORUNDUM MACHINISTS' SPECIAL STONE.

Made fine and medium.
Size 4″×1″×½″.
Price ... **2/3** each.

Fig. 1837. CARBORUNDUM VALVE GRINDING COMPOUND In Tubes.

Fine and coarse.
Price ... **1/–** per tube.

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GRINDERS.

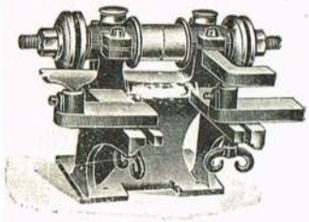


Fig. 1840. GRINDING MACHINE.
Fitted with grinding rests. Mild steel spindle and nuts. Cast iron body, pulleys and rests. Malleable oil cups. Bearings adjustable. Fitted fast and loose pulleys.

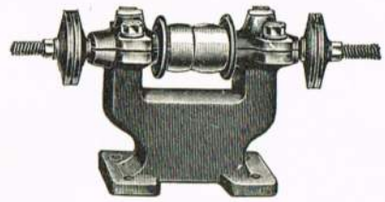


Fig. 1841. GRINDING MACHINE.
Fitted with mild steel spindle and nuts. Cast iron body. with oil cups and adjustable bearings.

Fig. 1842. POLISHING MACHINE.
Cast iron body. Adjustable bearings. Mild steel spindle. Malleable oil cups.

	Fig. 1840.					Fig. 1841.					Fig. 1842.		
No.	1	2	3	4	...	1	2	3	4	...	1	2	3	4
Height of centre, inches ...	6	8	10	12	...	6	8	10	12	...	6	8	10	12
Diameter of spindle in bearings, inches ...	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	...	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	...	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
Diameter of spindle at end	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	...	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	...	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$
Price each	**64/–**	**83/–**	**103/–**	**140/6**	...	**49/6**	**65/6**	**91/–**	**114/–**	...	**47/9**	**62/3**	**80/–**	**102/9**

Fig. 1840A.

CAST IRON STANDS
for above heads.

These stands are specially made for the above.

The height over all is 30″ in each size.

Drilled and tapped to take 4 holding-down set screws.

No.	1	2	3	4
Price each ...	**62/–**	**62/–**	**65/–**	**65/–**

Fig. 1843.

TREADLE GRINDING MACHINE.

This is a serviceable tool capable of much hard work wherever power is not available.

It is far in advance of hand operated grinders, as it leaves both hands free for holding the work.

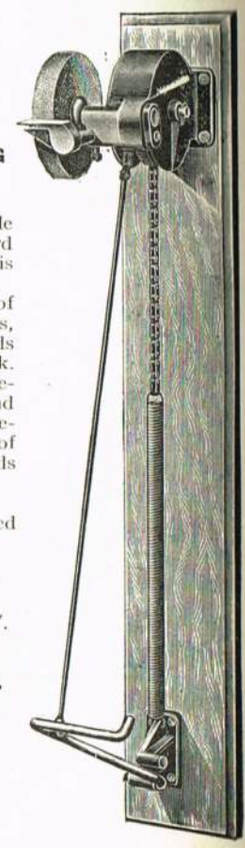
Fitted with machine-cut gears throughout, and a reliable free wheel movement, it is capable of attaining very high speeds

Mounted on varnished back board.

Adjustable tool rest.

Size of wheel, 6″ × 1″.

Price ... **£2 0 0.**



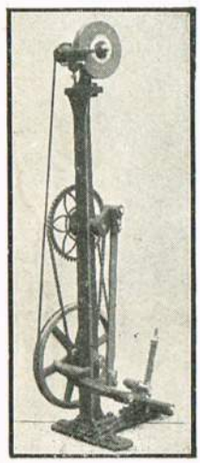


Fig. 1844. (No. 1).

TREADLE GRINDER DE LUXE.

For wheel up to 8″ diameter. Speed, 3,500 r.p.m. Ball bearings. Centres, 42″. Round leather belt. Adjustable tool rest. Chain-tightening device. Shipping weight, 85 lbs. Shipping bulk in lots of six machines, about $1\frac{3}{4}$ cubic feet each.

PRICES :

As a grinder	**£6 5 0**
As a combined buffer and grinder, with tapered and threaded spindle	**£6 10 0**

Fig. 1844. (No. 2).

TREADLE GRINDER.

For wheel up to 8″ diameter. Speed 2,000 r.p.m. Ball bearings. Centres, 42″. Round leather belt. Adjustable tool rest. Shipping weight, 95 lbs. Shipping bulk in lots of six machines, about $1\frac{3}{4}$ cubic feet each.

PRICES :

As a grinder	**£5 0 0**
As a buffer and grinder	**£5 5 0**

Fig. 1844. (No. 3).

TREADLE GRINDER.

Identical with No. 2, except it is without ball bearings. Will carry wheel up to 10″ diameter.

PRICES :

As a grinder	**£4 0 0**
As a buffer and grinder	**£4 8 0**

Extra $\frac{1}{2}$″ Flat Leather Belt instead of Round Belt, **5/–**.

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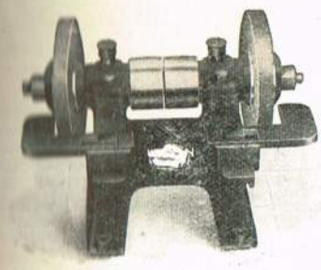

Fig. 1846. Plain Bearings.

GRINDERS.

Fig. 1846

Fitted with plain bearings and fast and loose pulley.

Fig. 1846A.

Fitted with ball bearings and fast and loose pulley.

Fig. 1846B.

Same as Fig. 1846,, with one grinding wheel only.

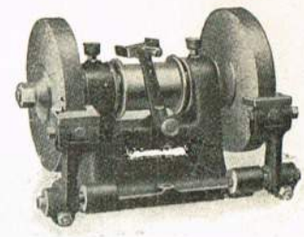

Fig. 1847. Ball Bearings.

Number ...	Fig. 1846.			Fig. 1847.			Fig. 1846B.
To carry wheels up to, inches ...	10 × 1 ¾″ hole	12 × 1½ 1″ hole	14 × 2 1¼″ hole	10 × 1 ¾″ hole	12 × 1½ 1″ hole	14 × 2 1¼″ hole	10 × ¾ ¾″ hole
Height from base to centre, inches ...	8	9	9	8	8½	9	6
Length of spindle overall, inches ...	14½	22¼	26	16	20½	25½	12¼
Diameter of spindle in bearings, inches ...	⅞	1⅛	1⅜	⅞	1¼	1½	⅞
Size of pulleys, inches	2¾ × 1¾	3¾ × 2¼	4¾ × 2⅞	3 × 1¾	3¾ × 2¼	4¾ × 2⅞	3¾ × 1⅝
Speed, r.p.m.	2100	1700	1400	2100	1700	1400	2100
Price (without grinding wheels)	£2 12 6	£4 10 0	£6 12 6	£6 10 0	£8 10 0	£11 10 0	£1 17 6
Extra if mounted on cast iron stand ...	£2 10 0	£2 15 0	£3 15 0	£2 10 0	£2 15 0	£3 15 0	£2 10 0
Extra for cast iron guards...	—	—	—	£1 0 0	£1 10 0	£2 0 0	—

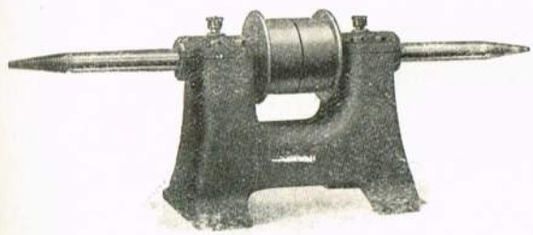

Fig. 1850. Plain Bearings.

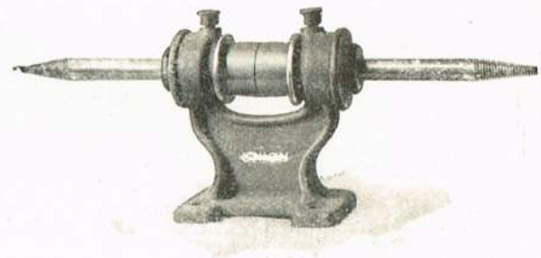

Fig. 1851. Ball Bearings.

Number	Fig. 1850.					Fig. 1851			
Height to centre, ins.	5	6	7½	9	12	6	7½	9	12
Length of spindle, ins.	18	24	30	35½	42½	20	28	32	40
Diam. of spindle in bearings, inches	⅝	⅞	1⅛	1 5/16	1½	¾	1⅛	1¼	1½
Size of pulleys, ins.	3 × 1½	3½ × 1¾	4¾ × 2⅛	5 × 2⅜	6 × 2⅝	2¼ × 1½	2¾ × 1¾	3½ × 2¼	4½ × 2½
Price—									
With plain ends	£1 19 0	£2 12 6	£3 10 6	£4 8 6	£6 3 0	£3 0 0	£4 15 0	£5 15 0	£8 12 6
With one plate end	£2 5 6	£3 3 6	£4 2 0	£5 0 6	£6 15 0	£3 7 6	£5 5 0	£6 5 0	£9 2 6
With two plate ends	£2 12 6	£3 10 6	£4 11 6	£5 12 6	£7 10 0	£3 15 0	£5 15 0	£6 15 0	£10 0 0
Extra if on c.i. stand	£2 10 0	£2 10 0	£2 10 0	£2 15 0	£3 15 0	£2 10 0	£2 10 0	£2 15 0	£3 15 0

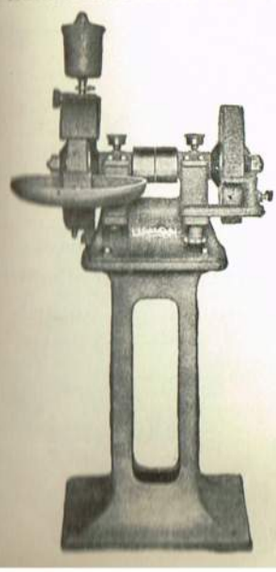

Fig. 1852.

COMBINED WET AND DRY GRINDERS.

To carry wheels up to ... ... inches	10 × 1 × ¾ hole	12 × 1½ × 1 hole	14 × 2 × 1¼ hole
Height of centre, inches	8	9	9
Length of spindle, inches	14½	22¼	26
Diameter of spindle in bearings, inches	⅞	1⅛	1⅜
Size of pulleys, inches	2¾ × 1¾	3¾ × 2¼	4¾ × 2⅞
Speed, r.p.m.	2100	1700	1400
Price, mounted on cast iron stand, but without grinding wheels	£7 12 6	£10 5 0	£14 10 0

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GRINDERS.

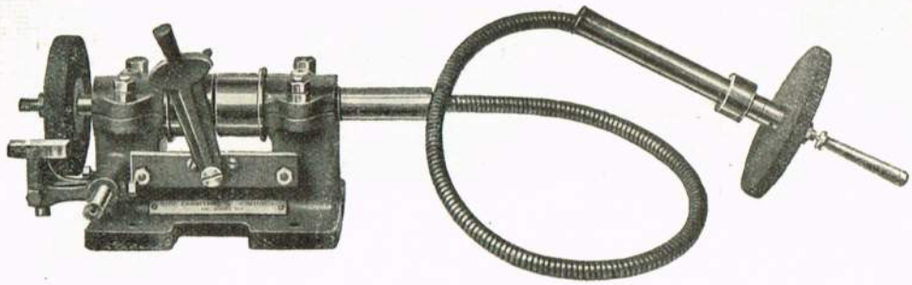

Fig. 1853. COMBINED BENCH AND FLEXIBLE GRINDER.

With phosphor bronze bearings, ring oilers, ball-race housed in pulleys, alternate drive and belt shifter. 'lexible drive, 6 ft. long, fitted with ball-bearing handles, to take wheels up to 5″ × ½″. Fixed spindle to take wheels ″ × 1″. Speed 2000–3000 r.p.m.

Price each .... **£16 0 0** without wheels.

Fig. 1854. FLEXIBLE STEEL SHAFTING.

Combining an unequalled uniformity of strength, durability, flexibility, and steady transmission of power.

The shafts are made only of the finest steel wire, are solid through, and undergo a special heat treatment, to reset ıe molecules which become distorted or displaced in the process of winding, thus completely eliminating the "kick" ›und in most shafts after short use.

The standard shafts are made to run anti-clockwise, but clockwise can be supplied if desired.

o. 1 Drive—Inner core 6 m/m diameter brass outer casing, with ball bearing in handle, length 4 ft. 6 ins., standardised and detachable (for cleaning and oiling), to transmit ¼-h.p. at 3,000 to 4,000 r.p.m.; suitable for light grinding and polishing; together with accessories for internal and external grinding. **£2 15 0.**

o. 2 Drive.—Similar to No. 1, but with steel interlock casing, ⅜″ diameter core; length 6 ft., and capable of transmitting ⅓ to ½-h.p. at 2,000 to 3,000 r.p.m., together with accessories. **£5 10 0.**

o. 3 Drive.—Similar to No. 2, but having a special detachable gun-metal handle, fitted with double ball-bearings, driven by powerful inner core of ½″ diameter, capable of transmitting ⅔ to 1-h.p. at 1,500 r.p.m.; guaranteed to be absolutely steady at 2,000 r.p.m.; length 8 ft. Complete with accessories, **£10 0 0.**

Fig. 1855.

EXHIBITION BENCH GRINDER.

Made of best close-grain cast-iron. Spindle made of best quality mild steel, 15/16″ diameter, and screwed ¾″ left and right hand Whitworth. Fitted with adjustable rests, with heavy dished flanges, and fast and loose pulley. 2⅜″ diameter, fitted with automatic syphone lubrication. Will run for some considerable time without attention. The whole is enamelled red.

Price .... **60/-** each.

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OIL STONES AND EMERY CLOTH.

Fig. 1856. No. 1 WASHITA OILSTONE.
Packed in 14 lb. boxes, **2/6** per lb.

Fig. 1857. RAZOR HONES. Dimensions, $5\frac{1}{4}'' \times 2'' \times \frac{1}{2}''$
Price, **27/–** per dozen.

Fig. 1859. No. 1 WASHITA ROUND EDGE SLIP.
$3—5 \times 1\frac{3}{4}—2 \times \frac{3}{8}—\frac{5}{8} \times \frac{1}{8}—\frac{5}{16}$
Packed in 5 lb. boxes. **3/–** per lb.

Fig. 1858. PIKE OIL. Acidless and non-drying
Will not gum nor corrode.
Small size, 2 ozs., **10/6** dozen.
Large size, 6 ozs., **18/–** doz.

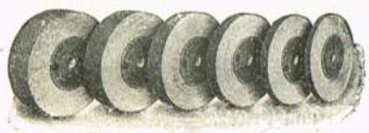

Fig. 1860. ALOXITE is made up in convenient size rolls in widths $\frac{1}{4}''$, $\frac{1}{2}''$, $\frac{3}{4}''$, $1''$, $1\frac{1}{2}''$, $2''$, $2\frac{1}{2}''$, nicely wound on metal spools for convenient use. All rolls are of 50 yards length.

Fig. 1861. ALOXITE TAPES. 50 Yards in Length.

Width.	Aloxite Grit Nos. / Equivalent Grit in Emery.	Grits. 100 and finer. —	90 $\frac{1}{2}$ (1)	80 1 ($1\frac{1}{2}$)	70 $1\frac{1}{2}$ (2)	60 2 ($2\frac{1}{2}$)	46 $2\frac{1}{2}$ (3)	36 3 (4)	24 $3\frac{1}{2}$ —
$\frac{1}{4}''—\frac{1}{2}''$	... ...	**5/–**	**5/3**	**5/6**	**5/9**	**6/–**	**6/3**	**6/6**	**7/–**
$\frac{3}{4}''$	... ...	**6/6**	**6/9**	**7/–**	**7/3**	**7/9**	**8/3**	**8/6**	**9/–**
$1''$	... ...	**7/9**	**8/–**	**8/3**	**9/–**	**9/6**	**9/9**	**10/6**	**11/–**
$1\frac{1}{2}''$	... ...	**10/6**	**10/9**	**11/6**	**12/–**	**12/9**	**13/6**	**14/6**	**15/6**
$2''$	... ...	**13/–**	**13/6**	**14/3**	**15/3**	**16/–**	**17/3**	**18/6**	**19/9**
$2\frac{1}{2}''$	... ...	**15/9**	**16/3**	**17/3**	**18/3**	**19/6**	**20/9**	**22/6**	**24/3**

Fig. 1862. EMERY CLOTH.

No.	00—$1\frac{1}{2}$	2—3	$3\frac{1}{2}$—4	
Best Blue Twilled ...	**115/6**	**132/–**	**148/6**	per ream.
Emery Cloth, white back	**54/–**	**65/–**	—	„

Fig. 1863. GLASS PAPER AND CLOTH.

No.	00—F2	M2—S2	$2\frac{1}{2}$—3	
Glass Cloth	**50/–**	**54/6**	**54/6**	per ream
Glass Paper	**22/–**	**25/6**	**31/6**	„

Fig. 1864. Raybestos TRADE MARK REGISTERED **ASBESTOS AND BRASS BRAKE LINING.**

Thickness inches.	Prices per foot. 1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	4	$4\frac{1}{2}$ inches wide.
$\frac{5}{32}$ ...	**2/5**	**3/–**	**3/7**	**4/1**	**4/9**	**5/3**	—	—	—	—	—
$\frac{3}{16}$ ...	**2/8**	**3/5**	**4/1**	**4/8**	**5/5**	**5/11**	—	—	—	—	—
$\frac{1}{4}$ ...	**3/7**	**4/5**	**5/5**	**6/3**	**7/1**	**7/11**	—	—	—	—	—
$\frac{5}{16}$ ...	**4/5**	**5/6**	**6/6**	**8/1**	**8/9**	**9/11**	**11/1**	**12/2**	**13/2**	**17/7**	**19/9**

Fig. 1864A. ALUMINIUM COUNTERSUNK HEAD RIVETS.
Sizes—$\frac{1}{8}''$ diam., $\times \frac{1}{2}''$, $\frac{3}{4}''$, $\frac{7}{8}''$, $\frac{15}{16}''$; $\frac{5}{32}''$ diam. $\times \frac{1}{2}''$, $\frac{5}{8}''$, $\frac{3}{4}''$, 1; $\frac{3}{16}''$ diam. $\times \frac{1}{2}''$, $\frac{5}{8}''$, $\frac{3}{4}''$, $\frac{7}{8}''$, $1''$, $1\frac{1}{4}''$; $\frac{1}{4}''$ diam. $\times \frac{7}{8}''$, $1''$, $1\frac{1}{4}''$. Price, **9d.** per oz., **7/6** per lb.

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PAINT MILLS.

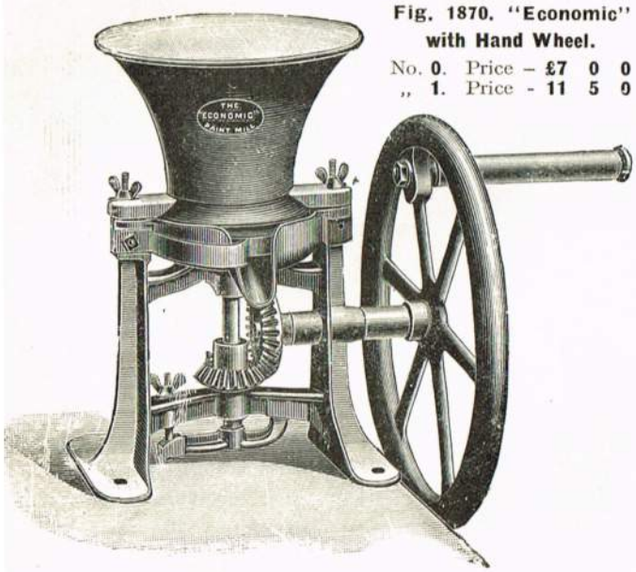

Fig. 1870. "Economic" with Hand Wheel.

No. **0.** Price – **£7 0 0**
,, **1.** Price - **11 5 0**

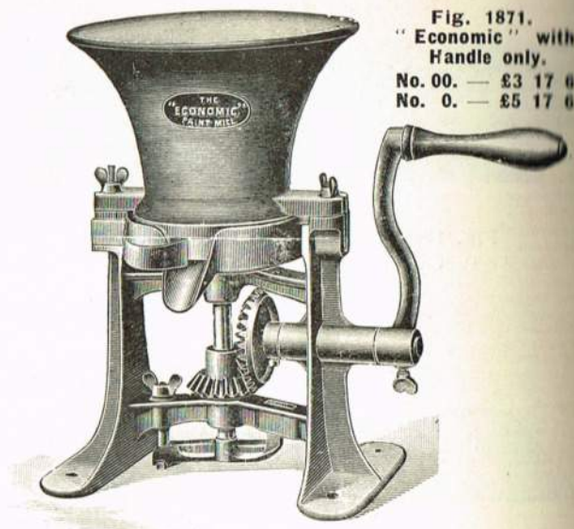

Fig. 1871. "Economic" with Handle only.

No. 00. — **£3 17 6**
No. 0. — **£5 17 6**

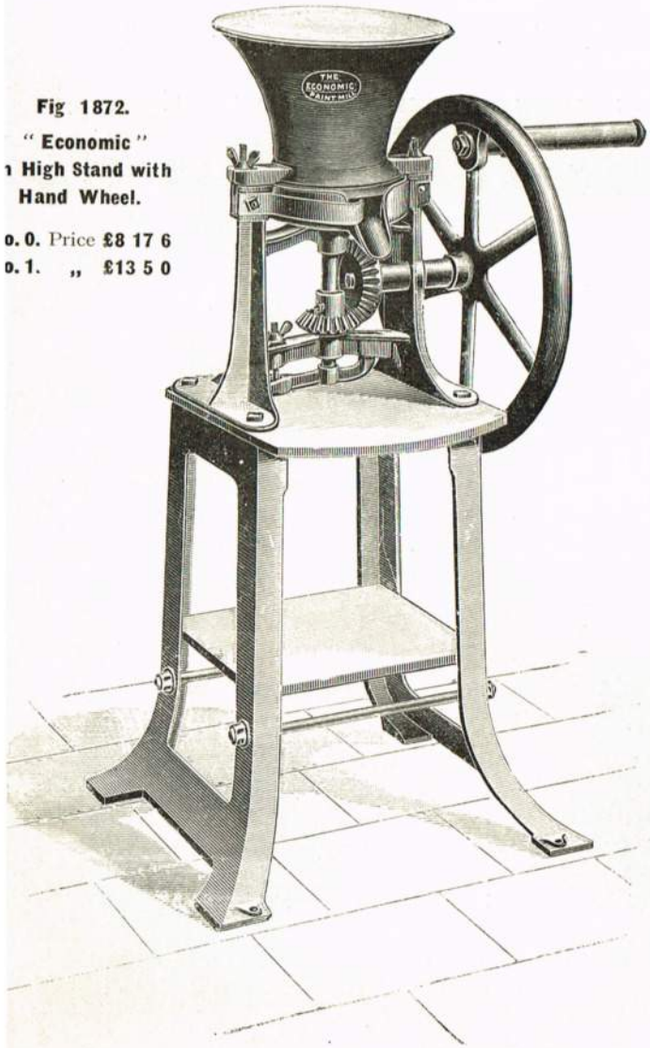

Fig 1872.

"Economic"
ı High Stand with Hand Wheel.

o. 0. Price **£8 17 6**
o. 1. ,, **£13 5 0**

NEWLY DESIGNED "ECONOMIC" PAINT MILLS.

The "Economic" Paint Mill is of the latest design and intended to meet the demand for a really serviceable and high-class machine at a low price for painters, coach builders, millwrights, etc. The interior of the hopper, as well as the annular trough and spout, is lined with a durable coat of white vitrified enamel. By using this machine paints may be ground in oil or water to a degree of fineness not otherwise obtainable; old dry paint and skins can be re-ground and used up for priming. In every way it is highly recommended, and is indispensable in every workshop where paint is used either in small or large quantities.

Description and Prices.

No.	Type	Approx. Weight of Mill	Diam. of Cone.	Approx. Quan. Ground per day.	Capacity of Hopper.	Height of Mill.
00	Hand	0 0 21	4½	56 lbs.	1	1 3
0	Hand	0 1 8	6	1 to 1½ cwt.	3½	1 5
0	With Hand Wheel	0 2 2	6	,,	3½	1 5
0	With f. & l. pulleys	0 1 22	6	,,	3½	1 5
0	With hand wheel on high stand	1 0 4	6	,,	3½	3 6
1	With hand wheel	1 0 0	7	2 to 3 cwt.	4	1 9
1	With hand wheel on high stand.	1 2 0	7	,,	4	3 10

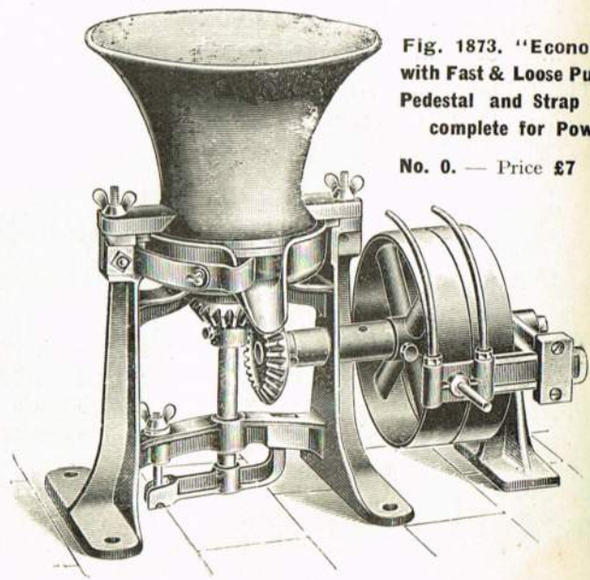

Fig. 1873. "Economic" with Fast & Loose Pulleys, Pedestal and Strap Fork, complete for Power.

No. 0. — Price **£7 5 0**

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PLANES.

All Planes and Plane Irons are manufactured from best quality materials. The wood is selected best quality wood and guaranteed not to warp. The steel is best quality Sheffield cast steel. Every one guaranteed.

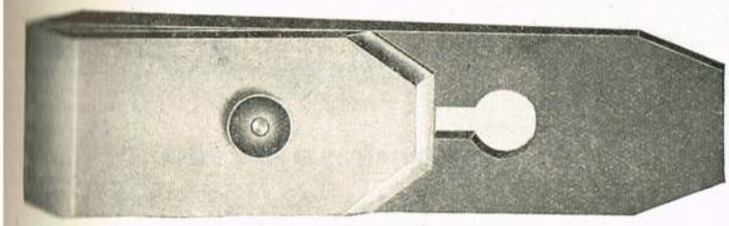

Fig. 1900. DOUBLE PLANE-IRONS.

Size, inches	$1\frac{1}{2}$–$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$
Price each	**2/10**	**2/11**	**3/–**	**3/2**	**3/4**	**3/6**	**3/8**

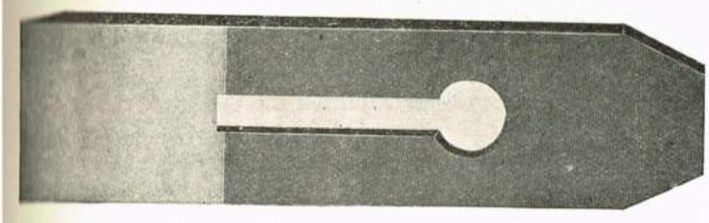

Fig. 1901. CUT PLANE-IRONS.

Size, inches	$1\frac{1}{2}$–$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$
Price each	**1/8**	**1/9**	**1/10**	**1/10**	**2/–**	**2/2**	**2/4**

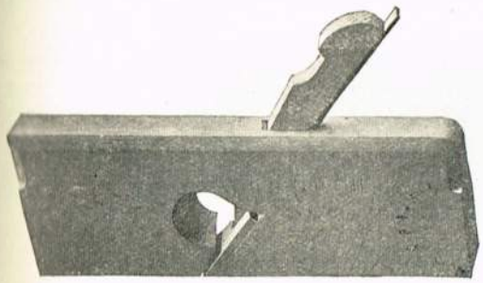

Fig. 1902. REBATE PLANE.

Size, inches ...	$\frac{1}{2}$–$1\frac{1}{4}$	$1\frac{1}{2}$–2
Price each ...	**5/2**	**6/–**

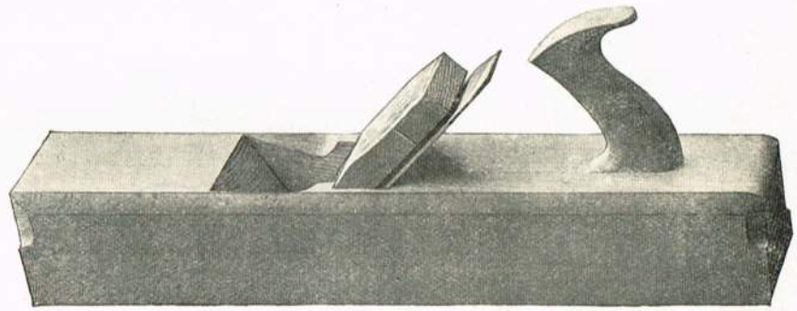

Fig. 1903. JACK PLANES, Fitted Double Irons.

Size, inches	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$
Price each	**12/6**	**12/10**	**13/2**	**16/–**
Price each, without iron ...	**9/6**	**9/8**	**9/10**	**12/4**

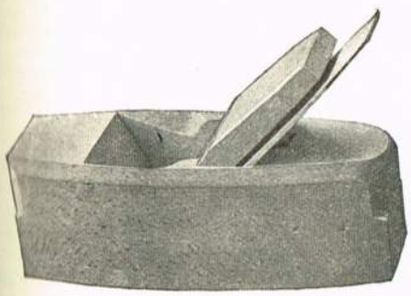

Fig. 1904.
SMOOTH PLANES. Fitted Double Irons.

Size, inches ...	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$
Price each ...	**8/–**	**8/2**	**8/6**	**8/8**	**9/–**	**9/4**	**10/2**
Price, without irons	**5/2**	**5/4**	**5/6**	**5/8**	**5/10**	**6/–**	**6/6**

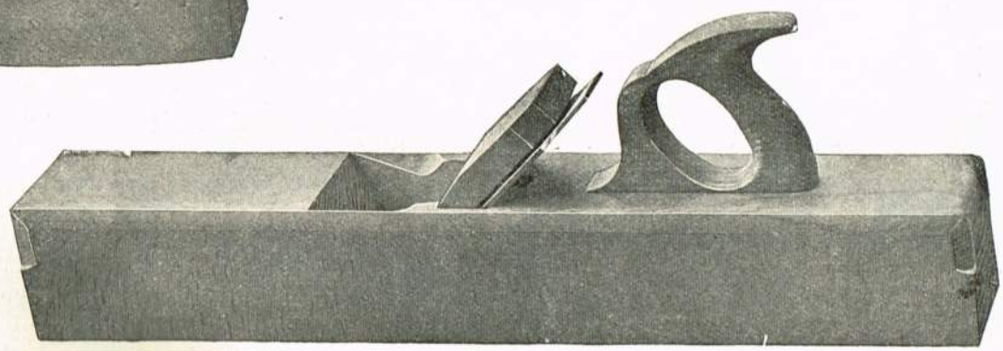

Fig. 1905. TRYING PLANES. Fitted Double Irons.

Size, inches	22	24	26	28	30	$\times 2\frac{1}{2}$
Price each	**17/2**	**17/6**	**17/10**	**18/4**	**19/–**	

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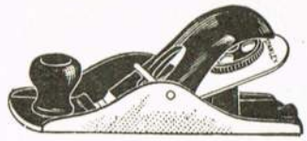
STANLEY AND BAILEY BLOCK PLANES.

No. S101.

No. S100.


Nos. S102 and S110

No. S103.

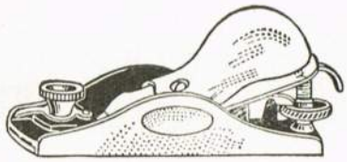
No. S120.

Nos. S203 and S220.

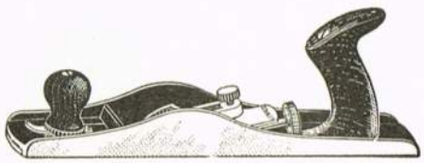
Nos. S9½, S15, S16 and S17.

Nos. S9¾ and S15½.

Nos. S18 and S19.


No. S65.

Nos. S60 and S60½.


No. S62.

Stanley Non-Adjustable Block Planes.

No.		Length	Cutter	Each
S101	... ...	3½″	1″	**1/9**
S100.	Handled	3½″	1″	**2/3**
S102.	... ...	3½″	1⅜″	**3/6**
S110.	... ...	7½″	1⅝″	**5/–**

Stanley Adjustable Block Planes.

No.		Length	Cutter	Each
S203.	Screw adjustment ...	5½″	1⅜″	**6/3**
S220.	... ...	7½″	1⅝″	**7/3**
S103.	Lever	5½″	1⅜″	**5/–**
S120.	Lever	7½″	1⅝″	**7/–**

Bailey Adjustable Block Planes.

No.		Length	Cutter	Each
S 9½.	Japanned	6″	1⅝″	**9/6**
S15.	,, ...	7″	1⅝″	**10/–**
S16.	Nickelled	6″	1⅝″	**10/9**
S17.	,, ...	7″	1⅝″	**11/9**
S 9¾.	Japanned, rosewood handle	6″	1⅝″	**11/–**
S15½.	,, ,, ,,	7″	1⅝″	**12/–**
S18.	Nickelled, knuckle joint ...	6″	1⅝″	**12/6**
S19.	,, ,, ,, ...	7″	1⅝″	**13/3**

Nos. 18 and 19 are distinctive in the method of fastening the cutter. The knuckle joint in the cap makes it also a lever, and placing the cap in position clamps the cutter securely to its seat.

Stanley Low-Angle Block Planes.

No.		Length	Cutter	Each
S65.	Nickelled	7″	1⅝″	**13/3**
S60.	,, ...	6″	1⅜″	**11/–**
S60½.	Japanned	6″	1⅜″	**10/–**
S62.	,, ...	14″	2″	**23/3**

No. S 62 is especially adapted for use in cutting across the grain on heavy work, where more power is required than can be obtained by the use of the ordinary block plane. It is fitted with a rosewood handle and knob, and is designed to be operated with both hands.

STANLEY SPECIAL BLOCK PLANES.

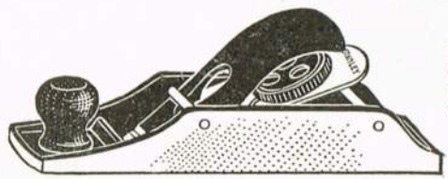
No. S75.

Bull Nose Rabbet Plane, No. S 75.

Japanned; length, 4″; cutter, 1″.

Price ... **3/–** each.

Double-End Block Plane, No. S130.


No. S130.

Two slots and two cutter seats. The centre seat and slot to be used for ordinary block plane work, the other slot and seat for use as a bull-nose plane.

Japanned; length, 8″; cutter, 1⅝″.

Price ... ... **7/3** each.

Rabbet and Block Plane, No. S140.

No. S140.

A detachable side will easily change it from a block plane to a rabbet plane, and *vice versa*.

The cutter is adjustable endwise, and set on a skew. Nickelled.

Length, 7″; cutter, 1¾″.

Price ... **12/6** each.

Adjustable Double-End Block Plane, No. S 131.

No. S131.

A combination block and bull nose plane. It has two slots and a moveable cutter seat, centre cutter seat, and slot for ordinary block plane, reverse end for bull nose plane. Japanned.

Length, 8″; cutter, 1⅝″. Price ... **11/7** each.

PRICES.

Nos.	S9½	S9¾	S15	S15½	S16	S17	S18	S19	S60	S60½	S62	S65
Price each	**9/6**	**12/–**	**10/–**	**12/–**	**10/9**	**11/9**	**12/6**	**13/3**	**11/–**	**10/–**	**23/3**	**13/3**

Nos.	S75	S100	S101	S102	S103	S110	S120	S130	S131	S140	S203	S220
Price each	**3/–**	**2/3**	**1/9**	**3/6**	**5/–**	**5/–**	**7/–**	**7/3**	**11/6**	**12/6**	**6/3**	**7/3**

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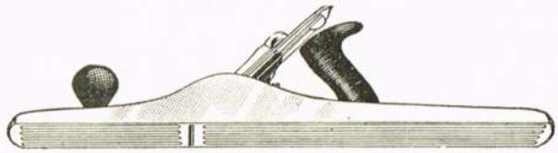
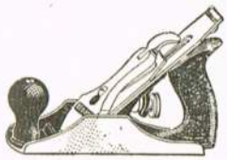
STANLEY, BAILEY & GAGE PLANES.

Nos. S1 to S3.

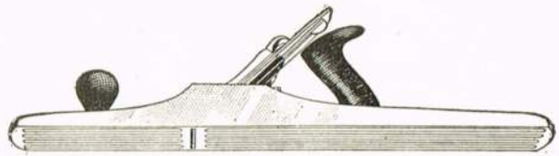
Nos. S7 and S8.



Nos. S7C and S8C "Bailey" Planes.



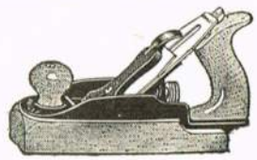
Nos. S602 and S603.



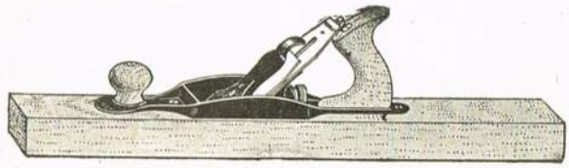
Nos. S607 and S608.

Nos. S607C and S608C "Bed Rock" Plane.

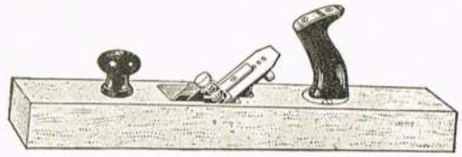
Nos. S22 and S24.



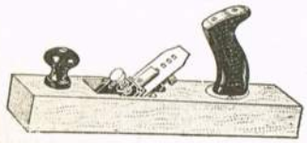
Nos. S35 and S36.



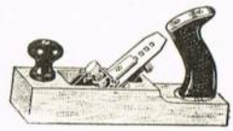
Nos. S 31 and S32.



Nos. S G28 and SG30.



No. SG26.



No. SG35.

BAILEY ADJUSTABLE IRON PLANES.

Nos. S1 to S8 with Smooth Bottoms.

Nos. S3C to S8C with Corrugated Bottoms.

Smooth bottom No.	Price each	Corrugated bottom No.	Price each	Style of plane	Length ins.	Cutter ins.
S1	**12/6**	—	—	Smooth	5½	1¼
S2	**16/2**	—	—	,,	7	1⅝
S3	**16/9**	S3C	**17/6**	,,	8	1¾
S4	**18/3**	S4C	**19/3**	,,	9	2
S4½	**21/–**	S4½C	**22/–**	,,	10	2⅜
S5	**21/–**	S5C	**22/–**	Jack	14	2
S5½	**23/9**	S5½C	**25/-**	,,	15	2¼
S6	**27/–**	S6C	**28/3**	Fore	18	2⅜
S7	**30/9**	S7C	**32/6**	Jointer	22	2⅜
S8	**36/9**	S8C	**38/9**	,,	24	2⅝

STANLEY "BED-ROCK" PLANES.

Nos. 602 to 608 with Smooth Bottoms.

Nos. 603C to 608C with Corrugated Bottoms.

Smooth bottom No.	Price each	Corrugated bottom No.	Price each	Style of plane	Length ins.	Cutter ins.
S602	**17/9**	—	—	Smooth	7	1⅝
S603	**18/6**	S603C	**19/3**	,,	8	1¾
S604	**20/3**	S604C	**21/3**	,,	9	2
S604½	**23/-**	S604½C	**24/3**	,,	10	2⅜
S605	**23/–**	S605C	**24/3**	Jack	14	2
S605½	**26/–**	S605½C	**27/6**	,,	15	2¼
S606	**29/9**	S606C	**31/3**	Fore	18	2⅜
S607	**34/–**	S607C	**35/9**	Jointer	22	2⅜
S608	**40/6**	S608C	**42/6**	,,	24	2⅝

BAILEY WOOD PLANES.

No.	Style of plane	Length ins.	Cutter ins.	Price each
S22	Smooth ...	8	1¾	**14/3**
S24	,, ...	9	2	**15/–**
S26	Jack ...	15	2	**15/6**
S27½	,, ...	15	2¼	**17/9**
S28	Fore	18	2⅜	**19/6**
S31	Jointer ...	24	2⅜	**21/–**
S32	,, ...	26	2⅝	**22/9**
S35	Handled smooth	9	2	**17/6**
S36	,, ,,	10	2⅜	**19/9**
S37	Jenny Smooth	13	2⅝	**21/6**

GAGE SELF-SETTING PLANES.

The self-setting feature lies in the fact that the plane iron when taken out to be honed or sharpened, goes back in exactly the same position as before removal. This also applies to the taking out of the plane cap to allow removal of the cutter.

No.	Style of plane	Length ins.	Cutter ins.	Price each
SG26	Jack	14	2	**22/–**
SG28	Fore	18	2¼	**25/–**
SG30	Jointer ...	22	2¼	**26/9**
SG35	Smooth ...	10	2	**20/–**

Nos. ...	S1	S2	S3	S3C	S4	S4C	S4½	S4½C	S5	S5C	S5½	S5½C	S6	S6C	S7	S7C	S8	S8C	S22	S24
Price each ...	**12/6**	**16/–**	**16/9**	**17/6**	**18/3**	**19/3**	**21/–**	**22/–**	**21/–**	**22/–**	**23/9**	**25/–**	**27/–**	**28/3**	**30/9**	**32/6**	**36/9**	**38/9**	**14/3**	**15/–**

Nos. ...	S26	SG26	S27½	S28	SG28	SG30	S31	S32	S35	SG 35	S36	S37	S602	S603	S603C	S604	S604C	S604½
Price each ...	**15/6**	**22/5**	**17/9**	**19/6**	**25/–**	**26/9**	**21/–**	**22/9**	**17/6**	**20/–**	**19/9**	**21/6**	**17/9**	**18/6**	**19/3**	**20/3**	**21/3**	**23/–**

Nos. ...	S604½C	S605	S605C	S605½	S605½C	S606	S606C	S607	S607C	S608	S608C
Price each	**24/3**	**23/–**	**24/3**	**26/–**	**27/6**	**29/9**	**31/3**	**39/–**	**35/9**	**40/6**	**42/6**

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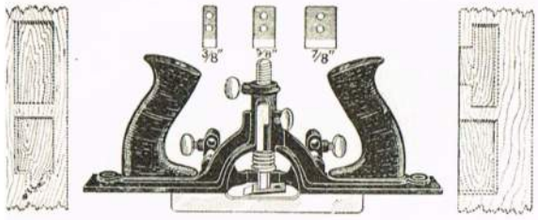
STANLEY PLANES.

No. S95.

No. S95 EDGE TRIMMING PLANE.

It has a right-angle rest or guide from the cutter edge ,and the cutter works on a skew, giving an easy shaving cut. Wood blocks of various bevels may be attached, enabling the user to make a slanting cut ; japanned.

Length, 6″, $\frac{7}{8}$″ cutter ... ... **7/9** each.

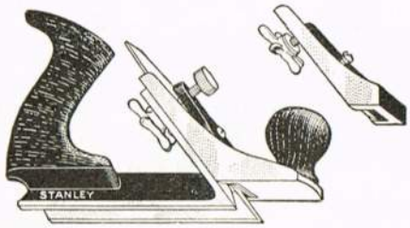


No. S171.

No. S171 DOOR TRIM PLANE.

This new plane will make mortices for butts, face plates, strike plates, escutcheons, etc., up to a depth of $^{5}/_{16}$″ and a width of 3″. Depth of cut governed by positive stop. By removing the fence and locking the cutter post with the thumb screw instead of using the spring, a very superior router plane is obtained. Three forged steel cutters, $\frac{3}{8}$″, $\frac{5}{8}$″, and $\frac{7}{8}$″ wide included ; japanned. Extra cutters can be supplied.

Length, 11″ ... ... **24/3** each.

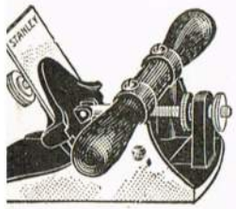


No. S72.

No. S72 ADJUSTABLE CHAMFER PLANE.

This plane will do perfect chamfer or stop-chamfer work. It has a 90 degree **V** bottom which acts as a mitre guide. To this is attached an adjustable front A having a flat bottom which carries the cutter ; this front can be set for different sizes of chamfer. A bull-nose front B (furnished) can be substituted for A, permitting the plane to be worked close up into corners ; japanned.

No. S72. 9″ long, $1\frac{5}{8}$″ cutter ... **18/–** each.



No. S12.

No. S85.

No. S85 CABINETMAKERS' SCRAPER PLANE.

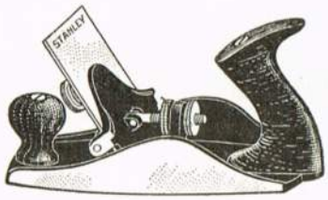
Blade is pressed lightly against front of mouth. In working it springs back, allowing shaving to pass through. As pressure is released, blade springs back again.

No. S85. Length, 8″ ; blade, 2″ ; rabbet mouth,
tilting handle and knob... ... ... **19/–** each
Extra blades ... ... **2/3** ,,

No. S12 VENEER SCRAPER PLANES.

Double Handle.

Length, $6\frac{1}{4}$″ ; blade, 3″ ... ... **20/6** each
Extra blade ... ... **2/3** each



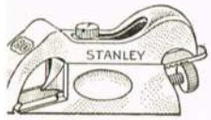
No. S112.

Nos. S212 and S112. Single Handle.

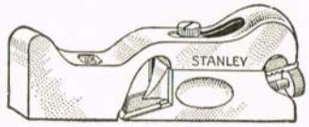
The blades are adjustable endwise and for angle. Can also be used as a toothing plane, in scraping off old paint or glue, and in roughing up the surface of wood preparatory to veneering same ; japanned.

No. S212. Length, $5\frac{1}{2}$″ ; blade, $1\frac{3}{8}$″ ... ... **12/9** each
No. S112. Length 9″ ; blade, 3″ ... ... **18/–** ,,

Extra Blades for No. S212, **2/2** ; No. S112, **2/2**.



No. S90.

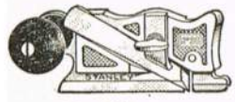


No. S93.

Nos. S90 S94 CABINETMAKERS' RABBET PLANES.

For fine cabinet or other accurate work. The planes will lie perfectly flat on either side, and can be worked either right or left hand. Adjustable throats and cutters. Plane No. 90 is bull-nosed ; nickel-plated.

No. S90. 4″ long, 1″ cntter ... ... **16/9** each
No. S92. $5\frac{1}{2}$″ ,, $\frac{3}{4}$″ ,, ... **16/9** ,,
No. S93. $6\frac{1}{2}$″ ,, 1″ ,, ... **20/–** ,,
No. S94. $7\frac{1}{2}$″ ,, $1\frac{1}{4}$″ ,, ... **23/–** ,,



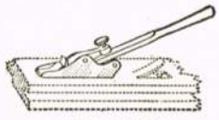
No. S98.

No. S99.

Nos. S98 and S99 SIDE RABBET PLANES.

For side-rabbeting and trimming dados, mouldings, and grooves of all sorts ; nickel-plated.

No. S98. 4″ long, $\frac{1}{2}$″ cutter, right hand ... ... **9/3** each
No. S99. 4″ ,, $\frac{1}{2}$″ ,, left hand ... ... **9/3** ,,



No. S96.

No. S96 BLIND NAIL TOOL.

Attach to a $\frac{1}{4}$″ chisel (bevelled edge up) and a shaving of any desired thickness can be raised, for blind nailing or for inlaid work ; nickel-plated.

Length, $2\frac{1}{4}$″ ... ... **14/9** per doz.

s.	S12	S72	S85	S90	S92	S93	S94	S95	S96	S98	S99	S112	S171	S212
es	**20/6**	**18/–**	**19/–**	**16/9**	**16/9**	**20/–**	**23/–**	**7/9** each	**14/9** doz.	**9/3**	**9/3**	**17/8**	**24/3**	**12/9** each

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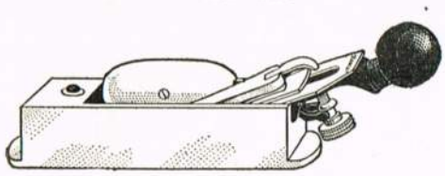
STANLEY PLANES & BEADERS.

No. S97.



No. S9.

CABINETMAKERS' EDGE PLANE, No. S97.

For piano makers and all cabinet workers. The cutter is adjustable endways; rosewood knob.

Length 10″, 2¼″ cutter ... ... **18/3** each

CABINETMAKERS' BLOCK PLANE. No. S9.

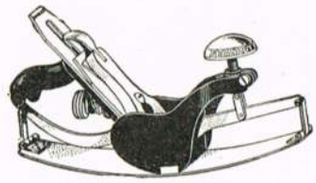
For finishing hard woods etc. Furnished with metallic handle for attaching to top on either edge when the plane can be used on a shoot board in planing mitres.

Length 10″ 2″ cutter ... ... **35/–** each

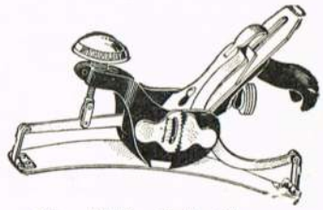
CIRCULAR PLANE, No. S113.

A valuable feature is the graduated scale on the gears, by means of which the face can be accurately set to work an arc of the same circle both concave and convex.

		Length	Cutter	Each
No. S113.	Japanned	10″	1¾	**31/–**



No. S113.—Right side.

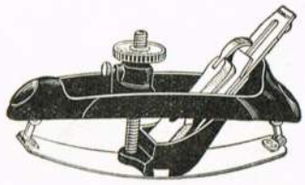


No. S113.—Left side.

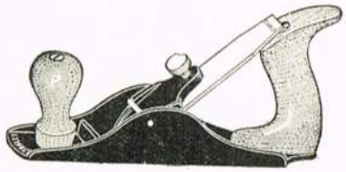
"VICTOR" CIRCULAR PLANE, No. S20.

The face is fastened at each end to the plane body and adjusted by screw at the centre. This construction gives great strength and simplicity.

		Length	Cutter	Each.
No. S20.	Japanned	10	1¾	**34/3**



No. S20.

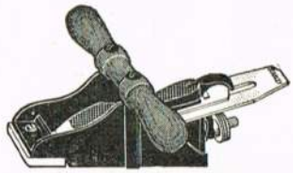


No. S40.

SCRUB PLANES, Nos. S40 and S40½.

Single iron with cutting edge rounded. Particularly adapted for roughing down work before using a jack or other plane.

		Length	Cutter	Each
No. S40.	Iron stock	9½″	1¼″	**10/3**
No. S40½.	,, ,, ...	10½″	1½″	**13/6**

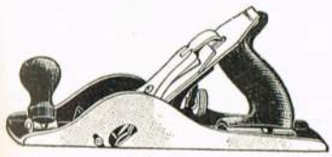


BELTMAKER'S PLANE, No. S11.

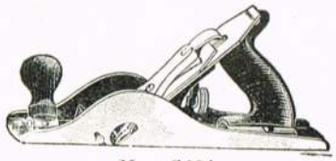
This tool is used by belt-makers for chamfering down the laps of a belt before fastening them together. It is equally well adapted for repairing belts in all large manufacturing establishments.

		Length	Cutter	Each
No. S11.	Beltmakers' plane ...	5¾″	2⅜″	**18/–**

CARRIAGE MAKERS' RABBET PLANES, Nos. 10, 10¼, 10½.



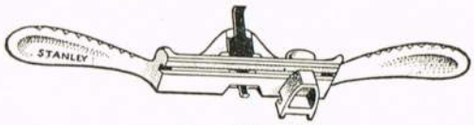
No. S10½.



No. S10¼.

		Length	Cutter	Each
No. S10½	... ...	9″	2⅛″	**22/3**
No. S10	... ...	13″	2⅛″	**26/9**
No. S10¼	... ...	13″	2⅛″	**32/–**

No. S10¼ differs from the other sizes in having tilting handle and knob, and spurs on both sides for working across grain.



No. S66.

UNIVERSAL TWO-HANDED BEADER, No. S66.

For beading, reeding, or fluting straight or irregular surfaces, and for light routering. A square gauge is included for straight work and an oval gauge for curved work. Also eight cutters sharpened at both ends: 6 single beads, 2 fluting, 4 reeding tools, 2 routers ⅛″ and ¼″, and ⅝″ blank. Nickel-plated.

Length, 11½″, 8 cutters ... ... **7/–** each.

PRICES OF CUTTERS.

Nos.	S9	S10	S10¼	S10½	S11	S20	S40	S40½	S66	S97	S113
Price each	**35/–**	**26/9**	**32/–**	**22/3**	**18/–**	**34/3**	**10/3**	**13/6**	**7/–**	**18/3**	**31/–**

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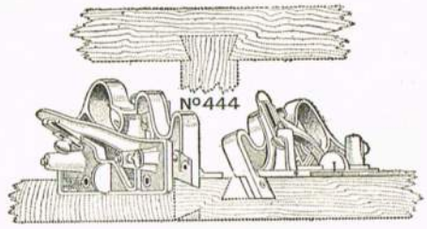
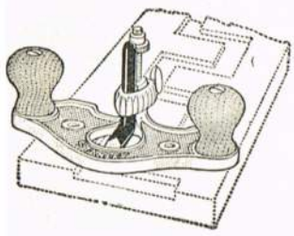
STANLEY PLANES.



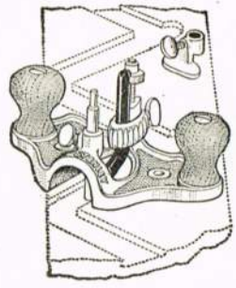
DOVETAIL TONGUE AND GROOVE PLANE, No. S444.

This novel tool forms a dovetail tongue and groove with one hand tool. It will cut any size grooves and tongues to fit with sides at flare of 20 degrees. where the width of neck is more than ¼″ and the depth of groove not more than ¾″. Tongue and groove can be made with parallel or tapering sides ; nickel-plated.

9″ long ... ... **45/6** each.



No. S71½.



No. S71.

ROUTER PLANES, Nos. S71 and S71½.

These planes are for surfacing the bottom of grooves or other depressions parallel with the general surface of the work. They are made in two styles, with closed and open throat. The latter has an attachment for regulating the thickness of the chip, and a second attachment for closing the throat for use on narrow surfaces. An extra wooden bottom of any size desired can be screwed on to bottom, enabling the user to router on large openings. A ¼″ and ½″ cutter are furnished with each plane ; nickel-plated.

No. S71. 7½″ long, open throat ... ... **17/–** each
No. S71½. 7½″ long, closed throat ... ... **13/3** ,,

No. S190.

HANDLED IRON RABBET PLANES, Nos. S190, S191, S192.

These Planes can be used equally as well with right or left hand. Made in two styles, one with a spur for working across the grain, and the other without a spur. Both styles are fitted with a detachable depth gauge. Japan finish.

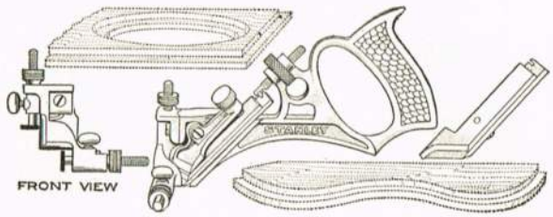
No. S190, 8″ long, 1½″ cutter, with spur ... ... **12/3** each
No. S191. 8″ ,, 1¼″ ,, ,, ... **11/6** each
No. S192. 8″ ,, 1″ ,, ,, ... **10/9** each

No. S78.

DUPLEX FILLESTER AND RABBET PLANE, No. S78.

This Plane has two seats for the cutter, one for regular work and the other where a bull nose is required. It has a spur and a removable depth gauge. The adjustable fence can be used on either side and slides under the bottom, regulating the width of the cut. To work same as a rabbet plane, remove fence and arms. Japanned.

8½″ long, 1½″ cutter ... ... **13/9** each.

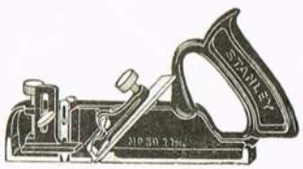


No. S196.

CURVE RABBET PLANE, No. S196.

This tool will cut rabbets on circular or other curved and irregular edges. It works equally well whether on the outside edges or on the edges of openings cut out of the surface of the work. It has two cutters fastened together by a screw to suit the work in hand. The upper cutter acts as a spur for the lower and also cuts the side of the rabbet. The lower cutter is a skew cutter which follows the spur and cleanly cuts the bottom of the rabbet. The stock and handle are cast in one piece. The plane is fitted with an adjustable depth gauge. The fence is also adjustable and has a curved face ; nickel-plated.

9″ long ... ... **30/6** each.



No. S39.

HANDLED IRON DADO PLANES, No. S39.

The plane is made in eight sizes, from ¼″ to 1″ in width. In ordering always give the number (39) and width of cutter desired. Length, 8″.

Sizes, inches	¼	⅜	½	⅝	¾	13/16	⅞	1
Price each	**12/3**	**13/–**	**13/9**	**14/3**	**15/–**	**15/9**	**15/9**	**16/6**

S39

s. ...	¼	⅜	½	⅝	¾	13/16	⅞	1 inch	S71	S71½	S78	S190	S191	S192	S196	S444
ce each	**12/3**	**13/–**	**13/9**	**14/3**	**15/–**	**15/9**	**15/9**	**16/6**	**17/–**	**13/3**	**13/9**	**12/3**	**11/6**	**10/9**	**30/6**	**45/6** each

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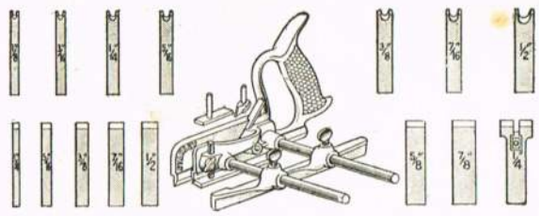
STANLEY PLANES.



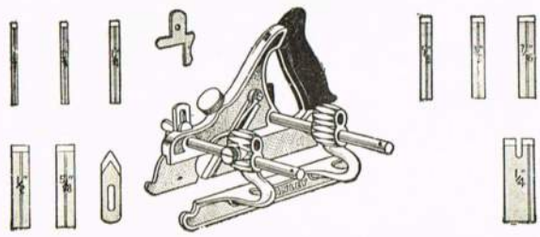
No. S50

PLOW, BEADING AND MATCHING PLANE

No. S50.

A very handy tool for light work. Fence has 5″ adjustment. The cutters comprise 7 plow and dado bits, $\frac{1}{4}$″, $\frac{5}{16}$″, $\frac{3}{8}$″, $\frac{7}{16}$″, $\frac{1}{2}$″, $\frac{5}{8}$″, and $\frac{7}{8}$″; 7 beading tools, $\frac{1}{8}$″, $\frac{3}{16}$″, $\frac{1}{4}$″, $\frac{5}{16}$″, $\frac{3}{8}$″, $\frac{7}{16}$″ and $\frac{1}{2}$″; and a $\frac{1}{4}$″ tonguing tool nickel-plated.

Length, $9\frac{1}{4}$″; 15 cutters ... ... **35/6** each.



No. S143.

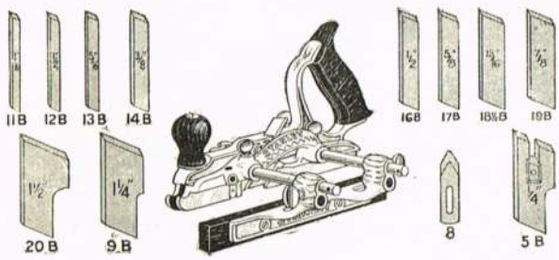
BULL NOSE PLOW, FILLETSTER AND MATCHING PLANE

No. S143.

This plane has two interchangeable front parts that makes it either an ordinary plow or a bull nose plow. With the bull nose attachment the cutter will easily work up to and into a $\frac{1}{2}$″ hole or any larger size, as in sash fitting, stair work, etc.

The cutters comprise 8 plow bits, $\frac{1}{8}$″, $\frac{3}{16}$″, $\frac{1}{4}$″, $\frac{5}{16}$″, $\frac{3}{8}$″, $\frac{7}{16}$″, $\frac{1}{2}$″ and $\frac{5}{8}$″; a $1\frac{1}{2}$″ filletster cutter; a $\frac{1}{4}$″ tonguing tool, and a slitting cutter; nickel-plated.

Length, $9\frac{1}{4}$″, 11 cutters ... ... **34/3** each



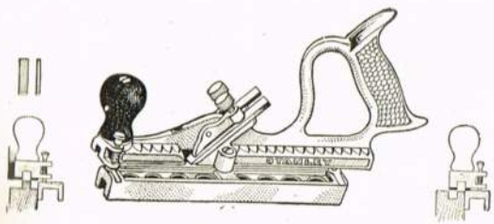
No. S48.

PLOW, DADO, FILLETSTER AND MATCHING PLANE

No. S46.

Skew cutters are the feature of this Plane. The cutters comprise 8 plow and dado bits, $\frac{3}{16}$″, $\frac{1}{4}$″, $\frac{5}{16}$″, $\frac{3}{8}$″, $\frac{1}{2}$″, $\frac{5}{8}$″, $\frac{13}{16}$″, $\frac{7}{8}$″ and $1\frac{1}{4}$″; a $1\frac{1}{2}$″ filletster cutter; a $\frac{1}{4}$″ tonguing tool, and a slitting cutter; nickel-plated.

Length, $10\frac{1}{2}$″, 12 cutters ... ... **45/6** each.



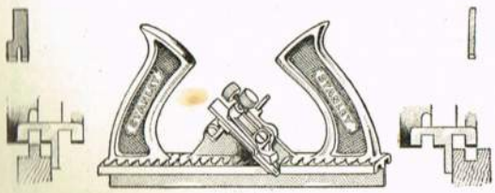
No. S48.

SWING FENCE MATCH PLANES

Nos. S48 and S49.

With two plow cutters of same width and one extra wide cutter. For cutting tongues and grooves at one setting by simply reversing fence.

No. S48. Cuts $\frac{5}{16}$″ groove, on boards $\frac{3}{4}$″ to $1\frac{1}{4}$″. Centres on $\frac{7}{8}$″ **22/3** each
No. S49. Cuts $\frac{3}{16}$″ groove, on boards $\frac{1}{2}$″ to $\frac{3}{4}$″. Centres on $\frac{1}{2}$″ **22/3** ,,



No. S46.

DOUBLE-END MATCH PLANES

Nos. S146, S147, S148.

These Planes have two separate cutters, a plow and a tongue tool, both governed by one permanent fence: nickel-plated with iron handles.

No. S146. Cuts $\frac{1}{8}$″ groove, on boards $\frac{3}{8}$″ to $\frac{1}{2}$″. Centres on $\frac{3}{8}$″ **16/9** each
No. S147. Cuts $\frac{3}{16}$″ groove, on boards $\frac{1}{2}$″ to $\frac{3}{4}$″. Centres on $\frac{5}{8}$″ **17/9** ,,
No. S148. Cuts $\frac{1}{4}$″ groove, on boards $\frac{3}{4}$″ to 1″. Centres on $\frac{7}{8}$″ **18/9** ,,

Nos.	S46	S48	S49	S50	S143	S146	S147	S148
Prices each	**45/6**	**22/3**	**22/3**	**35/6**	**34/3**	**16/9**	**17/9**	**18/9**

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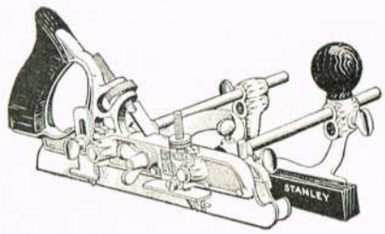
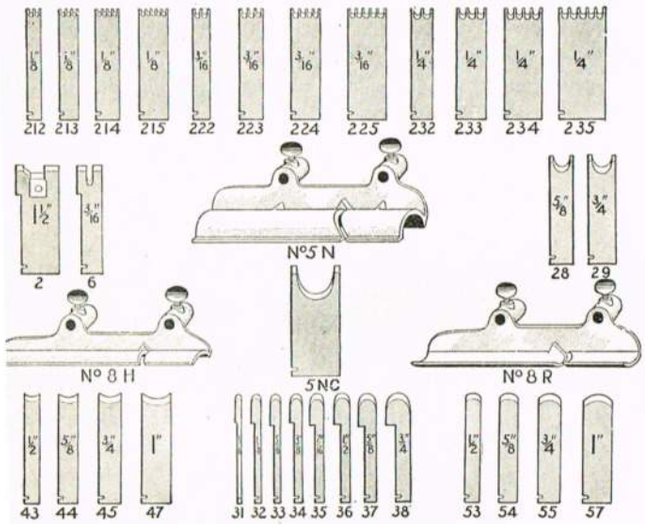
STANLEY No. S45 PLANE **Beading, Rabbet and Slitting.**





Seven tools in one in compact and practical form. :

1. Beading and centre beading plane.
2. Plow.
3. Dado.
4. Rabbet and Filletster.
5. Match plane.
6. Sash plane.
7. Slitting plane.

The plane has two principal parts, a main stock and a sliding section. The main stock carries the handle, cutter adjustment, a slitting tool, depth gauge, and forms a bearing for one edge of the cutter. The sliding section slides on two arms secured in the stock and has a bearing for the other edge, allowing cutters of different widths to be used.

A fence also slides on these arms for use when working as a plow, beader of filletster, to gauge the distance from the cutter to the edge of the board, and to keep the cutter at right angles to same.

When used as a filletster, the fence slides under the bottom of the plane and determines the width of cutter exposed to the work.

The plane is fitted with spurs for use across the grain, etc., and can be used either right or left hand. The handle, knob and fence are made of selected rosewood.

For beading at a distance from the edge of the board, attach cam rest (see cut at right of plane) to the front arm between the sliding section and fence to prevent the fence sagging. In certain work attach same to the rear arm to prevent the plane from rocking. The plane together with its 21 cutters is packed in a steel box.

SPECIAL BOTTOMS.

In order to work hollows and rounds, or a nosing cutter in the No. 45 Plane, substitute for the sliding section specially formed bottoms which are called hollows, rounds or nosing tools.

A hollow and its cutters will form a round on the moulding being worked. A round and its cutters will form a hollow. A nosing tool and its cutters will form what might be called an exaggerated round. It is very largely used for shaping the edges of stair treads. Hollows and rounds are made in four sizes and are usually sold in sets, a set comprising one hollow, one round and two cutters. The price of a nosing tool includes one cutter. Extra nosing tool cutters (5NC), **1/1** each.

Hollow and round—				Per pair
No. 6.	½″ cutters.	Work ¾″ circle ...	... ...	**9/6**
No. 8.	⅝″ ,,	,, 1″ ,,	... ...	**9/6**
No. 10.	¾″ ,,	,, 1¼″ ,,	... ...	**10/3**
No. 12.	1″ ,,	,, 1½″ ,,	... ...	**10/3**
Nosing tool :—				Each
No. 5.	1¼″ cutters.	Work 1¼″ circle	... ...	**7/9**

CUTTERS SUPPLIED WITH PLANE.

The price is given in case duplicates should be required.

			Each
1	1½″ ; style,	Sash tool	**4/3**
5	¼″ ,,	Match tool	**4/3**
3	,,	Slitting tool	**2/6**
9	1¼″ ,,	Filletster	**2/–**
)	⅛″ ,,	Plow and dado tool...	**1/3**
	3/16″ ,,	,, ,, ...	**1/3**
2	¼″ ,,	,, ,, ...	**1/3**
3	5/16″ ,,	,, ,, ...	**1/3**
	⅜″ ,,	,, ,, ...	**1/9**
	7/16 ,,	,, ,, ...	**1/9**
	½″ ,,	,, ,, ...	**1/9**
	⅝″ ,,	,, ,, ...	**1/9**
	¾″ ,,	,, ,, ...	**1/9**
½	13/16″ ,,	,, ,, ...	**2/–**
	⅞″ ,,	,, ,, ...	**2/–**
	⅛″ ,,	Beading tool	**1/3**
	3/16″ ,,	,, ,, ...	**1/3**
	¼″ ,,	,, ,, ...	**1/3**
	5/16″ ,,	,, ,, ...	**1/9**
	⅜″ ,,	,, ,, ...	**1/9**
	7/16″ ,,	,, ,, ...	**2/–**
	½″ ,,	,, ,, ...	**2/–**

SPECIAL CUTTERS.

No.			Each
2	1½″ ; style,	Sash tool	**4/3**
6	3/16″ ,,	Match tool	**4/3**
28	⅝″ ,,	Beading tool	**2/6**
29	¾″ ,,	,, ,, ...	**2/6**
31	3/16″ ,,	Fluting tool	**2/6**
32	¼″ ,,	,, ,, ...	**2/6**
33	5/16″ ,,	,, ,, ...	**2/6**
34	⅜″ ,,	,, ,, ...	**2/6**
35	7/16″ ,,	,, ,, ...	**2/6**
36	½″ ,,	,, ,, ...	**2/6**
37	⅝″ ,,	,, ,, ...	**2/6**
38	¾″ ,,	,, ,, ...	**2/6**
212	⅛ ,,	Reeding tool, 2 beads	**1/9**
213	⅛″ ,,	,, ,, 3 ,, ...	**2/6**
214	⅛″ ,,	,, ,, 4 ,, ...	**3/3**
215	⅛″ ,,	,, ,, 5 ,, ...	**4/2**
222	3/16″ ,,	,, ,, 2 ,, ...	**1/9**
223	3/16″ ,,	,, ,, 3 ,, ...	**2/6**
224	3/16″ ,,	,, ,, 4 ,, ...	**3/3**
225	3/16″ ,,	,, ,, 5 ,, ...	**4/3**
232	¼″ ,,	,, ,, 2 ,, ...	**1/9**
233	¼″ ,,	,, ,, 3 ,, ...	**2/6**
234	¼″ ,,	,, ,, 4 ,, ...	**3/3**
235	¼″ ,,	,, ,, 5 ,, ...	**4/3**

PRICE. including 22 Cutters ... Weight 9½ lbs. ... **66/3** each.

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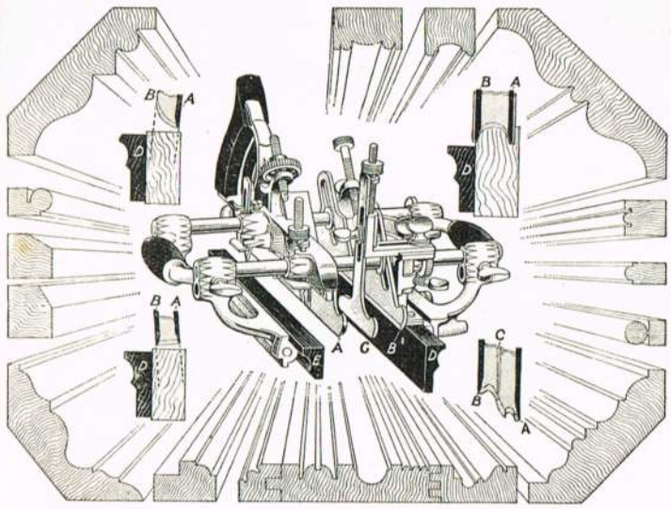
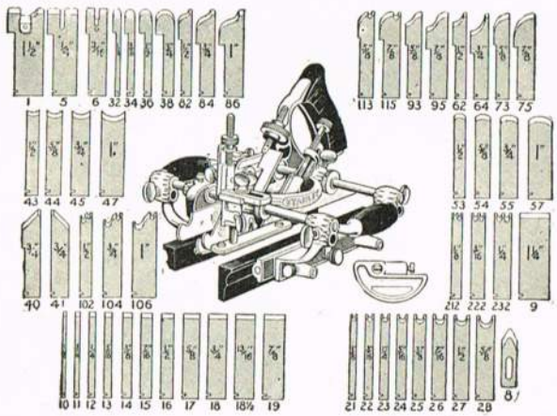
STANLEY No. S55 PLANE.





This Tool in addition to being a beading and centre beading plane, a plow, dado, rabbet, filletster, and a match plane, a sash plane and a slitting plane, is also a superior moulding plane, and will accommodate cutters of almost any shape and size. In fact, it is "A PLANING MILL WITHIN ITSELF."

The samples of work illustrated show some of the mouldings that can be made with cutters regularly furnished with each plane.

It has :

A Main Stock "A" which carries the cutter adjustment, a handle, a depth gauge, a slitting gauge, and has a steel bottom forming a bearing for one edge of the cutter.

A Sliding Section "B" with a steel bottom gives bearing for the other edge of the cutter and slides on arms secured in the main stock. This bottom can be raised or lowered, so that, in addition to allowing the use of cutters of different widths, cutters can be used having one edge higher or lower than the edge supported in the main stock.

An extra support or stock is necessary for cutters which first enter the wood at a point between the outside edges, and is a benefit for such cutters which, if the plane were accidentally tilted, would tend to gouge the work.

The Auxiliary Centre Bottom "C" which can be adjusted for width or depth, fulfils this requirement.

Fence "D" has a lateral adjustment, by means of a screw, for extra fine work. The fences can be used on either side of the plane, and the rosewood guides can be tilted to any desired angle up to forty-five degrees, by loosening the screws on the face. Fence "E" can be reversed for centre beading wide boards.

The Plane is fitted with spurs, also a special cam rest, to be located on the front arm when working at a distance from the edge of the board, to keep the fence from sagging, or on the rear arm on certain work, to prevent the possibility of the plane rocking.

The four small cuts in the corners show how the bottoms should be set for different forms of cutters, and the great importance of having the fences adjusted so that the cutters will not run.

Special Cutters can be furnished when desired.

Particulars and prices on application.

CUTTERS SUPPLIED WITH PLANE.

The following Cutters are furnished with each Plane. The price is given in case duplicates should be required.

No.	Size	Style	Each	No.	Size	Style	Each	No,	Size	Style	Each
1	1½″	Sash tool	**4/3**	24	5/16″	Beading tool... ...	**1/8**	62	½″	Quarter Hollow ...	**3/9**
5	¼″	Match tool	**4/3**	25	⅜″	,, ,, ...	**1/8**	64	¾″	,, ,, ...	**4/3**
8		Slitting tool	**2/6**	26	7/16″	,, ,, ...	**2/1**	73	⅝″	Quarter round ...	**3/9**
9	1¼″	Filletster	**2/–**	27	½″	,, ,, ...	**2/1**	75	⅞″	,, ,, ...	**4/3**
10	⅛″	Plow and dado tool	**1/3**	28	⅝″	,, ,, ...	**2/6**	82	½″	Reverse ogee ...	**3/9**
11	3/16″	,, ,, ...	**1/3**	29	¾″	,, ,, ...	**2/6**	84	¾″	,, ,, ...	**4/3**
12	¼″	,, ,, ...	**1/3**	32	¼″	Fluting tool ...	**2/6**	86	1″	,, ,, ...	**4/3**
13	5/16″	,, ,, ...	**1/3**	34	⅜″	,, ,, ...	**2/6**	93	⅝″	Roman ogee	**3/9**
14	⅜″	,, ,, ...	**1/9**	36	½″	,, ,, ...	**2/6**	95	⅞″	,, ,, ...	**4/3**
15	7/16″	,, ,, ...	**1/9**	38	¾″	,, ,, ...	**2/6**	102	½″	Grecian ogee ...	**3/9**
16	½″	,, ,, ...	**1/9**	43	½″	Hollow	**1/8**	104	¾″	,, ,, ...	**4/3**
17	⅝″	,, ,, ...	**1/9**	44	⅝″	,, ...	**1/8**	106	1″	,, ,, ...	**4/3**
18	¾″	,, ,, ...	**1/9**	45	¾″	,, ...	**1/8**	113	⅝″	Quarter round with bead	**3/9**
18½	13/16″	,, ,, ...	**2/–**	47	1″	,, ...	**1/8**	115	⅞″	,, ,, ...	**4/3**
19	⅞″	,, ,, ...	**2/–**	53	½″	Round	**1/8**	212	⅛″	Reading tool, 2 bead	**1/9**
21	⅛″	Beading tool ...	**1/3**	54	⅝″	,, ...	**1/8**	222	3/16″	,, ,, ...	**1/9**
22	3/16″	,, ...	**1/3**	55	¾″	,, ...	**1/8**	232	¼″	,, ,, ...	**1/9**
23	¼″	,, ,, ...	**1/3**	57	1″	,, ...	**1/8**				

PRICE, including 53 Cutters ... ... **130/3** each.

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STANLEY SPOKESHAVES.

No. S51.
Double iron, raised handle.

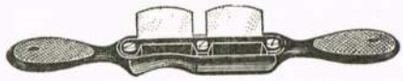
No. S52.
Double iron, straight handle.

No. S151. Adjustable Cutter.

No. S53.
justable mouth, raised handle.

No. S54.
Adjustable mouth, straight handle.

No. S55. Hollow face.



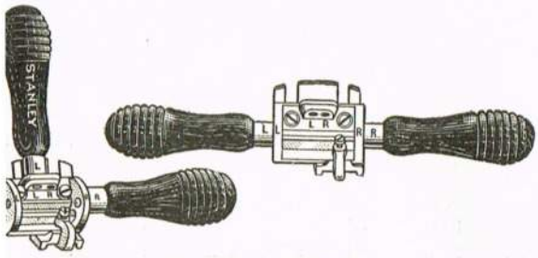
No. S60. Two Cutter.

No. S62. Reversible.

No. S63.
Double Iron, convex bottom.

No. S64.
Double Iron, straight bottom.

No. S65.
Adjustable Chamfer.



No. S67. Universal.

DOUBLE IRON, IMPROVED.

With cutter and cap iron. The thumb nut brings equal pressure on cutter edge, allowing adjustment without use of screwdriver.

		Length	Cutter	Doz.
No. S51.	Raised handle ...	10″	2⅛″	**24/3**
No. S52.	Straight handle ...	10″	2⅛″	**24/3**

ADJUSTABLE CUTTER.

Cutter can be quickly adjusted both endways and sideways. Adjusting screws engage the slots near the end.

		Length	Cutter	Doz.
No. S151.	Raised handle ...	10″	2⅛″	**34/3**

ADJUSTABLE MOUTH.

By means of a thumb screw the mouth can be opened or closed for coarse or fine work.

		Length	Cutter	Doz.
No. S53.	Raised handle ...	10″	2⅛″	**31/3**
No. S54.	Straight handle ...	10″	2⅛″	**31/3**

HOLLOW FACE.

This spokeshave has cutter with hollow face for all kinds of round work.

		Length	Cutter	Doz.
No. S55.	Raised handle ...	10″	2⅛″	**23/6**

TWO CUTTER.

Has two separate cutters and cutter seats, one hollow and one straight.

		Length	Cutter	Doz.
No. S60.	Straight handle ...	10″	1½″	**34/6**

REVERSIBLE.

Has two separate openings and cutters. Can be worked to or from user by simply turning wrist at end of each stroke.

		Length	Cutter	Doz.
No. S62.	Raised handle ...	10″	2⅛″	**42/–**

DOUBLE IRON (LIGHT).

Designed especially for light work. Thumb screw fastens cutter and cap iron. Straight handles.

		Length	Cutter	Doz.
No. S63.	Convex bottom ...	9″	1¾″	**14/–**
No. S64.	Straight bottom ...	9″	1¾″	**15/–**

ADJUSTABLE CHAMFER.

Can be adjusted to work chamfers up to 1½″, the width of cutter.

		Length	Cutter	Doz.
No. S65.	Raised handle ...	9½″	1½″	**42/–**

UNIVERSAL SPOKESHAVE, No. S67.

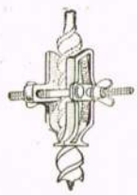
The handles are detachable, and either one can be screwed into the top of the stock, enabling the user to work into corners or panels, as no other spokeshave can do.

One handle has a right and the other a left-hand thread, preventing handles working loose.

Two detachable bottoms are furnished, one for straight and the other for circular work.

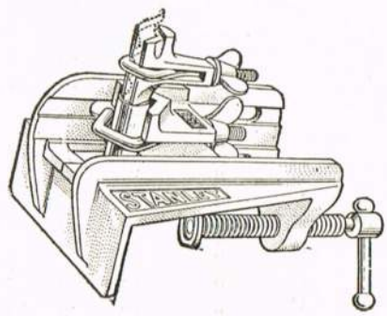
A movable width gauge allows the tool to be used in rabbeting. Nickel-plated, with rosewood handles.

		Length	Cutter	Doz.
No. S67.	Rosewood handle	9¼″	1⅞″	**103/3**



No. S49 STANLEY BIT GAUGE.

or any size bit up to 1″ diameter. Can be rately set for boring to any depth required. ps on both sides of the bit ensure it remain- upright when the desired depth is reached, s preventing it being bent or broken.
Length, 2½″. Nickel-plated.
3/9 each.



No. S59 STANLEY DOWELLING JIG.

This tool enables the user to bore dowel holes in the edge, end or surface of work, with ease and accuracy, up to 3″ thickness. It is also an excellent bit guide for mortising. When the jig is clamped to the work the steel guide for the bit is automatically set. Five steel guides 1¼″ long are furnished, ¼″, 5/16″, ⅜″, 7/16″ and ½″ respectively, an allowance of 100th inch above size being made to allow for variations in bits.

A depth gauge is also furnished which can be used with or without the jig.

The jig is made entirely of metal, nickel-plated, and the working parts are milled true.

Price ... **12/3** each.

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STANLEY SCRAPERS.

BOX SCRAPER, No. S70.

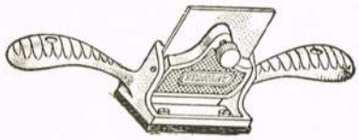
No. S70.

Malleable Iron Bottom.

		Length	Cutter	Doz.
No. S70.	Japanned	13″	2″	**61/6**

CABINET SCRAPERS.

No. S80.

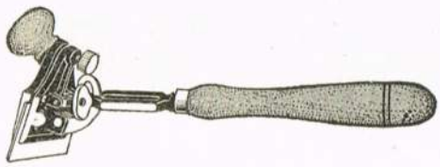


No. S81.

Handled Scrapers, Nos. S80 and S81.

Blade may be sprung to a slight curve by means of thumb screw. Raised handles.

		Length	Blade	Each
No. S80.	Japanned	11″	2¾″	**6/3**
No. S81.	Nickelled	10″	2½″	**10/3**

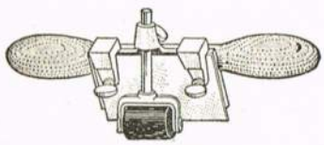


No. S82.

Adjustable Scraper, No. S82.

Has an adjustable single handle which can be tilted to give the blade any angle desired.

		Length	Blade	Each
No. S82.	Japanned	14½″	3″	**8/3**



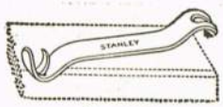
No. S83.

Roller Scraper, No. S83.

Has a roller the back of blade which acts as a support to relieve the strain on the wrists of the workman. Handle can be detached for working into corners.

		Length	Blade	Each
No. S83.	Nickelled	9½″	4″	**7/6**

CORNERING TOOL, Nos. S28 and S29.



No. S29.

For rounding sharp edges. They have a different size cutter at each end, and no depth gauge is required. Nickel-plated.

No. S28.	5½″ long, 1/16″ and ⅛″ cutters	Price ...	**20/3** per dozen
No. S29.	5½″ long, 3/16″ and ¼″ cutters		**21/3** ,,

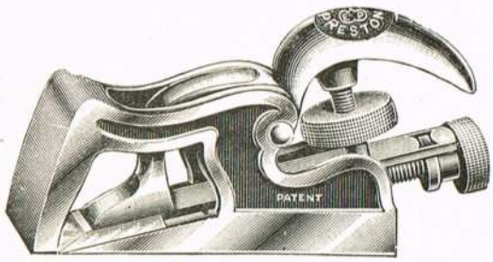


Fig. 1906.

PATENT ADJUSTABLE IRON BULL-NOSE RABBET PLANE.

Nickel-plated. 1½″ wide.

Price ... ... **6/–** each.

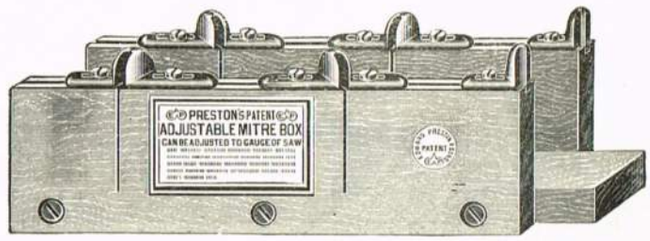


Fig. 1907.

PATENT IMPROVED ADJUSTABLE MITRE BOX.

Made in beechwood, with red japanned iron saw guides.
Can be adjusted to any gauge of saw.
With this mitre box no difficulty will be found in sawing a true mitre.
Specially suitable for amateurs, picture-framing and mitreing generally.
Will take mouldings up to 3″ wide.

Price ... ... **2/9** each.

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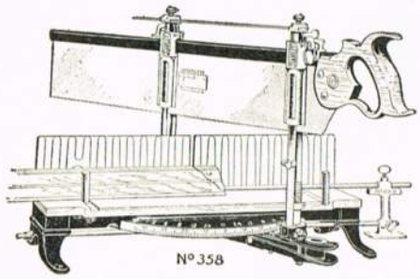
STANLEY MITRE BOXES AND SHOOT BOARD AND PLANE.



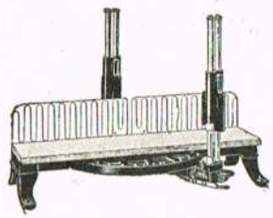
No. S358. STANLEY MITRE BOXES.

The frame is one solid casting, giving great strength. The saw guide uprights can be adjusted to hold the saw without play, and also to counteract a saw that runs out of true.

The swivel arm has tapered index pins engaging in holes on underside of base, allowing 3, 4, 5, 6, 8, 12 and 24 sided pieces to be cut, and can be set automatically at any angle. The uprights are graduated in 16th inch, and have adjustable depth stops. Two sockets in swivel for use of long or short saw. Saw is held above work when not in use. Box cannot slide when in use. The adjustable stop on top of the saw, engaging lever trip, releases the front catch, and the saw in falling pitches slightly forward automatically releasing the rear catch, without any necessity of taking the hand from the saw or touching the lever trip.

No.	Saw.	Capacity right angle	Capacity mitre (45°)	Capacity at 30° without stock guide	With Saw, each
240	20×4	8¼″	5½″	3½″	**97/4**
242	22×4	8¼″	5½″	3½″	**99/9**
244	24×4	8¼″	5½″	3½″	**102/1**
246	26×4	8¼″	5½″	3½″	**104/8**
346	26×4	9½″	6½″	4⅛″	**113/4**
358	28×5	9½″	6½″	4⅛″	**119/9**
460	30×6	11″	7½″	5⅛″	**143/6**

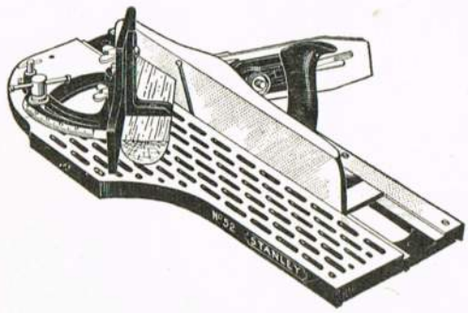
The saws supplied with these Mitre Boxes are expressly made for them by Hy. Disston & Sons.



No. S50½. "VICTOR" MITRE BOX.

This box has flat-faced guides. The back, frame, indexed quadrant, and swivel arm bearing are in one piece, accurately machined. The quadrant is indexed for cutting 4, 5, 6, 8, 12 and 24 sided pieces. The swivel arm can be locked at any point desired between zero and 45 degrees. The saw guide uprights can be adjusted to hold the saw without side play. Moveable stops are attached to the saw guide uprights, permitting the saw to cut only to the desired depth. To use a panel saw, put a nail through the two small holes near the top of the rear saw guide to keep the saw in place.

	Capacity Right angle	Capacity Mitre (45°).	Price without saw
No. 50½ ...	7¼″	4¾″	**47/10** each



No. S52. STANLEY SHOOT BOARD AND PLANE.

The Plane moves in a run-way formed in a base called a Shoot Board (sometimes termed "Jack Board"), ensuring absolutely the same position of cutter for every stroke.

As the cutter can be set at a slight angle to bottom of plane by means of a lever it is very useful for patternmakers in giving any draft desired to a pattern.

The base is ribbed, and the run-way for the Plane is adjustable and accurately machined.

The swivel can be securely locked at any angle desired, between zero and 90 degrees.

The sliding back can be adjusted close to the plane. It also has a sliding back clamp, for holding any shaped work.

The cutter is the regular "Bailey" type, adjustable endwise and sidewise.

		Plane	Cutter	Each
No. S52.	22″ long	15″ long	2⅜″	**82/1**

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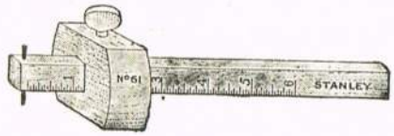
STANLEY MARKING AND BUTT GAUGES, Etc.

MARKING GAUGES.



No. S61.

Wood Marking Gauges, No. S61.

These marking gauges are made of selected wood, with oval bars, graduated in $^1/_{16}''$ for 6″ from point.

The marking points are of steel.

No. S61. Beech, boxwood screw, square head ... ... **7/9** each

No. S90.

Metal Marking Gauges, Nos. S90 and S97.

These gauges are of metal and have single steel bars, 6½″ long, graduated in $^1/_{16}''$ for 5″.

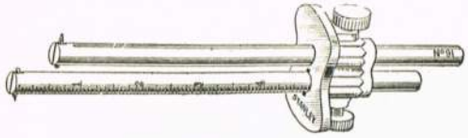
Two types of cutters are used—one a pin point and the other a roller cutter, for use close into rabbets or corners and recommended for working across grain, over knots, etc.

All parts are finely finished, and the metal bars and heads are nickel-plated.

No. S90. With pin point ... ... **2/9** each

No. S97. ,, ,, and roller cutters ... ... **4/6** ,,

No. S97.



No. S91.

Metal Mortise Gauges, Nos. S91 and S98.

These Gauges have double bars, 6½″ long, graduated in $^1/_{16}''$ for 5″. They correspond in other respects to the Metal Marking Gauges described above.

No. S91. With pin points ... ... **5/3** each

No. S98. ,, ,, and roller cutters ... ... **7/–** ,,

No. S98.

BUTT GAUGES.

No. S93.

In hanging doors there are three measurements to be marked, the location of the butt on casing, of butt on door, and thickness of butts on both casing and door.

These butt gauges have three separate cutters arranged with necessary clearances, so that no change of setting in the tool is required.

They are also rabbet marking and mortise gauges, with a scope sufficient for all door trim, including lock plates, strike plates, etc.

Cutter "A" marks from the jamb in the rabbet.

Cutter "B" from edge of door engaged in closing.

Cutter "C" the thickness of butt.

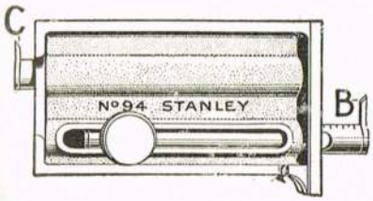
For nailed on strikes cutter "B" marks for the butt on both door and jamb, and cutter "C" the thickness of butt.

All bars are locked by set screws, and graduated in $^1/_{16}''$ for 2″. Nickel-plated.

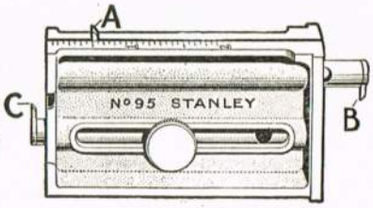
No. S93. Steel head, brass slide ... ... **6/6** each

No. S94. Iron body, steel bars ... ... **7/3** ,,

No. S95. ,, ,, ... **6/9** ,,

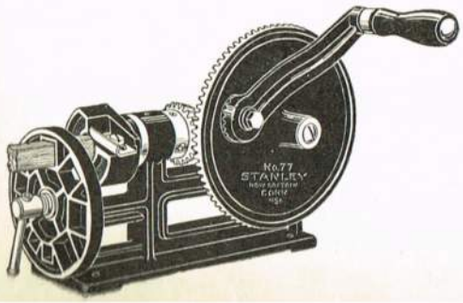


No. S94.



No. S95.

DOWEL AND ROD TURNING MACHINE, No. S77.



For cutting dowels of various sizes and lengths, also for forming rods of practically any length.

The crank can be adjusted for a long or short throw, giving power or speed to the machine as desired. One cutter head complete for making dowels or rods ⅜″ in diameter is furnished with each machine.

Additional cutter heads with cutters ¼″, $^5/_{16}''$, $^7/_{16}''$, ½″, $^9/_{16}''$, ⅝″, $^{11}/_{16}''$ and ¾″, can be furnished if desired.

No. S77. Japanned, weight 10 lbs. ... ... **52/9** each

Extra cutter heads ... **5/3** each.

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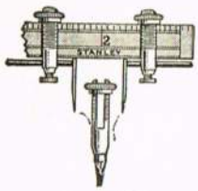
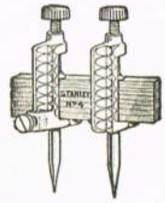
STANLEY TRAMMEL POINTS, BRACE BITS, &c.

TRAMMEL POINTS.



No. S99.



No. S4.

Nos. S1, S2 and S3.

Rule Trammel Points, No. S99.

Can be attached to carpenter's rules of any ordinary width. They have moveable steel points and a pencil socket.

Trammel Point for straight edge up to $\frac{3}{4}''$.

Price, per set of three in a box ... ... **4/6** per set

Nickelled Trammel Points, No. S4.

Can be attached to one side of any straight stick. The pencil socket will take an ordinary-sized pencil, or a full-sized oval-shaped carpenter's pencil.

Trammel Point, for straight edge up to $1\frac{1}{4}''$.

Price, nickel-plated, with steel points ... ... **5/–** per set

Bronze Trammel Points, Nos. S1, S2 and S3.

Strongly constructed and have steel points, on either of which an accompanying pencil socket can be clamped.

		Per set.
No. S1.	Trammel Point, for $\frac{5}{8}''$ straight edges	**7/–**
No. S2.	,, ,, $1''$,, ...	**9/–**
No. S3.	,, ,, $1\frac{1}{4}''$,, ...	**12/6**

PENCIL CLASP, No. S8.

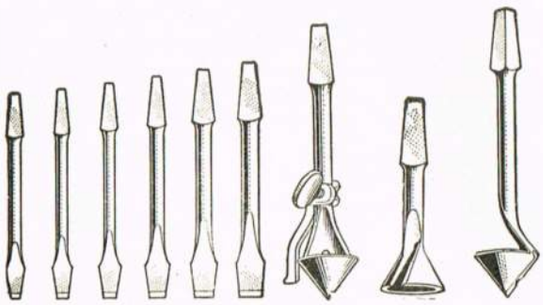
No. S8.

This tool is for attaching to a pair of ordinary dividers.
A very handy little article.

Length, $1\frac{1}{4}''$, nickel-plated ... ... **8/9** per doz.

Packed one dozen clasps on ornamental card, two cards in a box.

BIT BRACE TOOLS.



No. S26. No. S20. No. S22. No. S18.

Screwdriver Bits, No. S26.

These Bits are forged from crucible steel, oil tempered, and polished. They are made in seven sizes, as follows :—$4\frac{1}{2}''$ long by $^{3}/_{16}''$ and $\frac{1}{4}''$ tip, $4\frac{3}{4}''$ by $^{5}/_{16}''$, and $5''$ long by $\frac{3}{8}''$, $\frac{1}{2}''$, $\frac{5}{8}''$, and $\frac{3}{4}''$ tips respectively.

Assorted ... **12/5** per dozen.

Countersinks and Dowel Sharpeners.

These tools cut very rapidly, and can be readily re-sharpened. The depth gauge is a very convenient attachment. The tools are of malleable iron, nickel-plated.

No. S18.	Countersinks	**19/9** per doz.
No. S20.	Countersinks with depth gauge	**23/9** ,,
No. S22.	Dowel Sharpener	**21/3** ,,

Fig. 1908. (No. 195). STARRETT DOUBLE-LIP COUNTERSINK.

This is a double-lip self-centring wood countersink, and has a keen cutting edge. It will clear itself of its shavings in any kind of wood, and will cut a smooth, round hole. It is made from the best steel, forged, twisted, and tempered. It can be sharpened from the inside with a file.

Prices—$\frac{5}{8}''$, **2/6**; $\frac{7}{8}''$, **2/9**.

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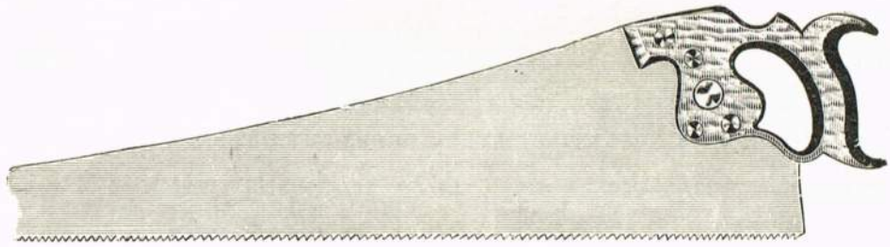
SAWS.



T. C. JONES' IMPROVED TEMPER CAST STEEL LONDON SAWS.
RIP, HALF-RIP, HAND AND PANEL SAWS.

Fig. 1910. American Pattern Skewback.

Special quality spring steel and finish. 5 raised brass screws.

Length, inches	16	18	20	22	24	26	28	30
Price per dozen...	**68/-**	**74/-**	**78/-**	**84/-**	**94/-**	**100/-**	**106/-**	**118/-**

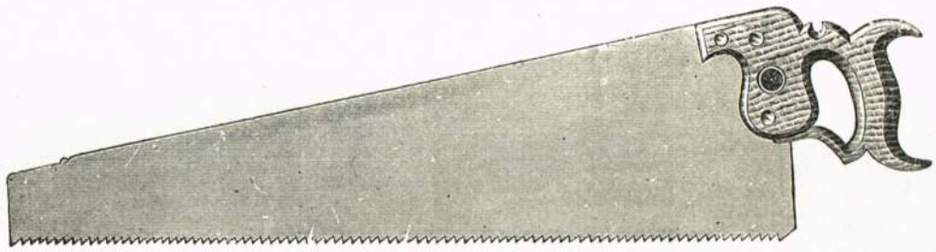
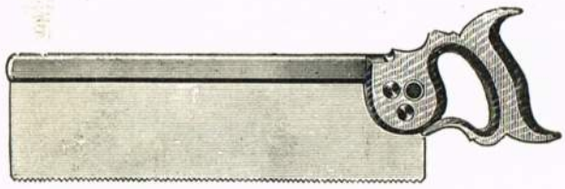


Fig. 1911. JONES' ORDINARY PATTERN BEST WARRANTED CAST STEEL HAND SAWS.

Beech handle. Raised screws.

Length, metres	10	12	14	16	18	20	22	24	26	28	30
London spring steel— Price per dozen ...	—	—	—	—	—	—	**74/-**	**84/-**	**90/-**	**96/-**	**108/-**
Cast steel, warranted— Price per dozen ...	**28/-**	**34/-**	**42/-**	**48/-**	**54/-**	**58/-**	**64/-**	**72/-**	**74/-**	**80/-**	**86/-**



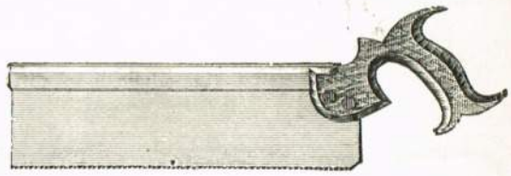


Fig. 1912. TENON OR BACK SAWS.

Beech Handle, Brass Screws.

Length, inches	10	12	14	16	18	20	22	24
Brass back saws, cast steel. Price per dozen ...	**72/-**	**80/-**	**90/-**	**104/-**	**112/-**	**118/-**	**128/-**	**140/-**
Iron back saws. Price per dozen	**56/-**	**60/-**	**64/-**	**72/-**	**76/-**	**78/-**	**84/-**	**90/-**

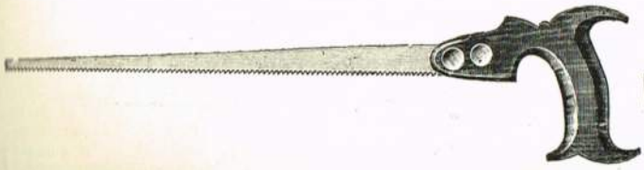


Fig. 1913. LOCK OR COMPASS SAWS.

Length, inches	10	12	14	16	18
Price per dozen	**20/-**	**21/-**	**22/-**	**24/-**	**26/-**

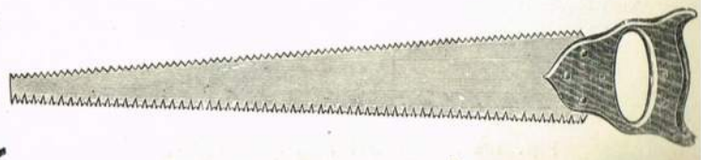


Fig. 1914. DOUBLE-EDGE PRUNING SAW.

Length, inches ...	12	14	16	18	20	22
Price per dozen ...	**42/-**	**51/-**	**58/-**	**65/-**	**70/-**	**77/-**

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SAWS.

Fig. 1915. BEST CAST STEEL CROSS-CUT SAWS.

Length, feet ...	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10
Price each ...	**13/–**	**15/–**	**18/–**	**19/–**	**22/–**	**24/–**	**26/–**	**31/–**	**39/–**	**45/–**	**54/–**	**62/–**	**72/–**

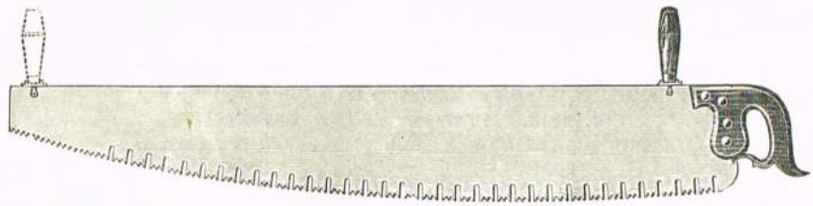

Fig. 1916. BEST CAST STEEL ONE-MAN CROSS-CUT SAWS.

Length, feet	3	3½	4	4½	5
Price each	**15/6**	**18/–**	**21/–**	**24/–**	**27/6**

Without loose handles, **1/6** each less. Extra loose handles, **1/6** each.

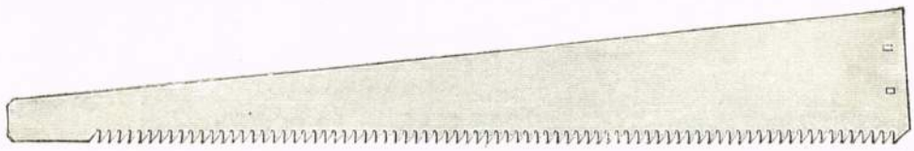

Fig. 1917. BEST CAST STEEL PIT SAWS.

Length, feet ...	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10
Price each ...	**16/6**	**17/6**	**19/6**	**21/–**	**24/–**	**26/–**	**28/–**	**33/–**	**39/–**	**46/–**	**54/–**	**62/–**	**72/–**

Saws exceeding 11″ heel to advance **2/–** per inch extra.

Fig. 1918. BEST CAST STEEL BATH STONE SAWS.

Length, feet	5	5½	6	6½	7	7½	8
Price each	**24/–**	**26/–**	**28/–**	**31/–**	**34/–**	**38/–**	**42/–**

Prices include up to 9″ wide. If wider, **3/–** per inch extra.

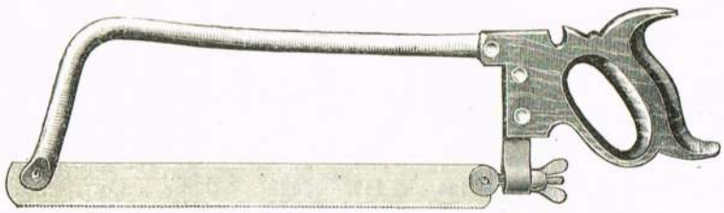

Fig. 1919. BEST WARRANTED BUTCHERS' BOW SAW.

Length, inches ...	12	14	16	18	20	22	24
Price per dozen—							
With wing nut ...	**76/–**	**76/–**	**79/–**	**82/–**	**86/–**	**98/–**	**107/–**
With rivetted blades	**64/–**	**64/–**	**67/–**	**71/–**	**80/–**	**87/–**	**93/–**
Blades only	**12/–**	**14/–**	**16/–**	**18/–**	**20/–**	**22/–**	**24/–**

Fig. 1920.
ELECTRICIANS' AND JEWELLERS' RACK SAW.

Best warranted polished beech handle.

Length, inches ...	4	5	6	7	8
Price per dozen ...	**11/6**	**13/–**	**14/6**	**17/–**	**21/–**

Fig. 1921. JIG OR FRET-SAW BLADES.

Length, inches ...	6	7	8	9	10	12
3/16″ wide, per gross ...	**30/–**	**30/–**	**32/–**	**36/–**	**39/–**	**42/–**
¼″ ,, ,, ...	**33/–**	**33/–**	**36/–**	**39/–**	**42/–**	**45/–**
⅜″ ,, ,, ...	**36/–**	**36/–**	**39/–**	**42/–**	**45/–**	**48/–**

If with pins at each end, **6/–** per gross extra.

Fig. 1922.
CAST STEEL PAD SAW BLADES.

Length, inches	8	9	10	11	12	14
Price per gross	**28/–**	**29/–**	**31/–**	**34/–**	**38/–**	**44/–**

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DISSTON'S SAWS.

Fig. 1930. D115. Latest and finest of **Disston Saws,** refined London spring steel, rosewood handle, carved and polished. Skew back, and fitted with nickel plated handle screws.

Size, inches ...	20	22	24	26
Cross cut points ...	10, 11	10, 11	9, 10, 11	7, 8, 9, 10, 11
Rip saw points ...	—	—	—	5, 5½, 6
Price per doz. ...	**£12 4 3**	**£12 18 9**	**£13 13 3**	**£14 7 6**

Fig. 1931. D15. Same as D115, but straight back.

Size, inches	24	26
Cross cut points	8, 9, 10	7, 8, 9, 10, 11
Rip points	—	5½, 6
Price per doz.	**£13 13 3**	**£14 7 6**

Fig. 1934. D8. The original **Skew Back Saw.** Warranted refined crucible steel. Patent ground and tempered. In hand, panel and rip.

Size, inches ...	16	18	20	22
Cross-cut points	9, 10	9, 10, 11	8, 9, 10, 11	8, 9, 10, 11
Rip saw points	—	—	7	7
Price per doz.	**£5 18 11**	**£6 8 0**	**£7 0 6**	**£7 10 9**

Size inches ...	24	26	28
Cross-cut points	7, 8, 9, 10, 11	5, 5½ 6, 6½, 7, 8 9, 10, 11	5, 6, 7, 8
Rip saw points	5, 5½, 6, 7	4½, 5, 5½, 6	3½, 4, 4½, 5, 5½, 6
Price per doz.	**£8 2 0**	**£8 10 0**	**£9 14 3**

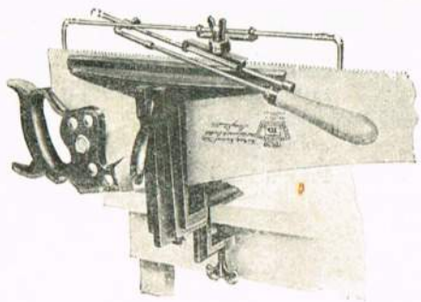

Fig. 1936. D3. SAW FILING GUIDE.

The illustration represents a saw clamped in position for filing. There are three marks on the upper hub of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position for one side, and the other designates when it is in position for filing the other side. The third, or centre mark, shows when it is in position for filing rip saws. To obtain the correct position, loosen the wing nut and move the guide around to the point desired. After tightening wing nut, loosen screw in file handle and adjust the file for the shape of tooth wanted.

Price, Guide and Clamp complete ... **£16 5 0** per doz.

Fig. 1932. D17. Skew back, refined crucible steel, warranted. Hardwood handle, polished. Brass screws, combination of teeth, alternate sections of five regular cross-cutting teeth and two ripping teeth. Free cutting. Easy, very rapid and clean cutting. Especially suitable for sawing diagonally across grain. Made in one size only, 26″.

Price ... **£9 3 3** per doz.

Fig. 1933. D7. The Original Hy. Disston Saw. Crucible steel. Grained blade. Warranted. Beech handle, full polished. Brass screws.

Size, inches ...	16	18	20	22
Cross-cut points	9, 10	9, 10, 11	8, 9, 10, 11	8, 9, 10, 11
Rip saw points	—	—	7	5½, 6, 7
Price per doz.	**£5 7 6**	**£5 13 3**	**£6 2 6**	**£6 15 0**

Size, inches ...	24	26	28
Cross-cut points	7, 8, 9, 10	5, 5½, 6, 6½, 7, 8, 9, 10	5, 6, 7, 8
Rip saw points	5, 5½, 6, 7	5, 5½, 6, 7	4, 4½, 5, 5½
Price per doz.	**£7 2 0**	**£7 10 0**	**£8 16 9**

Fig. 1935. No. 00. Jackson Warranted Crucible Steel. Patent ground and tempered. Grained blade. Beech handle. Polished edge. Brass screws.

Size	12	14	16	18	20
Price per doz. ...	**50/9**	**53/9**	**57/6**	**62/–**	**67/–**
Size	22	24	26	28	30
Price per doz. ...	**70/6**	**73/9**	**77/–**	**83/9**	**93/–**

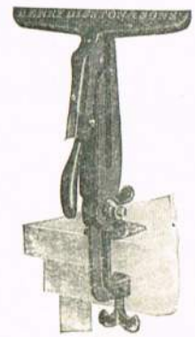

Fig. 1937.
No. 1 Saw File Clamp.
With hinged joint.
Price ... **116/9** per doz.

Fig. 1938.
No. 2 Saw File Clamp.
With adjustable ball and socket joint.
Price ... **158/3** per doz.

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DISSTON'S SAWS.

Fig. 1940. Disston No. 1 " Great American."
Five gauges. Thinner on back than on tooth edge.

Length, inches	48	54	60	66	72
Width at centre, ins.	6¼	6½	6¾	7	7¼
Price each	**20/–**	**22/6**	**25/–**	**27/6**	**30/**
Length, inches	78	84	90	96	
Width at centre, inches	7½	7¾	8	8¼	
Price each	**32/6**	**35/–**	**37/6**	**40/–**	

Fig. 1941. Disston No. 494 " Beaver."
Hollow back, for filling and brick sawing.
Three gauges thinner on back than on tooth edge.

Length, inches	48	54	60	66	72
Width at centre, ins.	4	4⅛	4⅜	4½	4⅞
Price each	**20/9**	**25/6**	**30/6**	**35/9**	**41/9**
Length, inches	78	84	90	96	
Width at centre, inches	5⅛	5⅜	5⅝	5⅞	
Price each	**48/3**	**54/6**	**63/–**	**70/**	

Fig. 1942. One Man No. 373 " Great American,"
with Supplementary Handle.

Length, inches	36	42	48	54
Width at butt, inches	7⅜	7½	7⅝	7¾
Price each	**15/9**	**18/3**	**20/9**	**23/9**
Length, inches	60	66	72	
Width at butt, inches	7⅞	8	8½	
Price each	**26/–**	**28/9**	**33/3**	

Fig. 1945. Cross-Cut Saw Handles.
No. 102½, for regular cross-cut saws, 13½″ × 1⅜″, **181/–** doz.
No. 103, for narrow cross-cut saws, 13½″ × 1⅜″, **196/6** doz.

Fig. 1945A.
No. 118 Supplementary Handle.
5¼″ × 15/16″. **11/–** per doz. **1/–** each.

Fig. 1943. Davis Back Saw No. 0.
Beech handle, polished edge. 10″ and 12″ made with open handle; 14″ with closed handle. All sizes made in 12-point only.

Size, inches	10	12	14
Price per doz.	**67/–**	**75/9**	**82/–**

Fig. 1944. Disston No. 4 Blue Back.

Size, ins.....	8	10	12	14	16
Price doz.	**108/–**	**116/9**	**131/3**	**148/9**	**164/6**

Fig. 1944A. No. 5 Solid Brass Back.
Price doz. **153/–** **162/–** **179/6** **194/3** **219/6**

No. 1. **No. 2.** **No. 4.**

Fig. 1946. Nos. 1, 2, 3. SAW SCREWS FOR DISSTON SAWS.

No. 1.	Centennial brass screws,	....	**23/9**	per gross
No. 2.	,, ,, ,,	....	**27/–**	,,
No. 3.	,, ,, ,,	small superior	**37/6**	,,
No. 4.	,, ,, ,,	large superior	**43/9**	,,

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DISSTON'S SAWS.

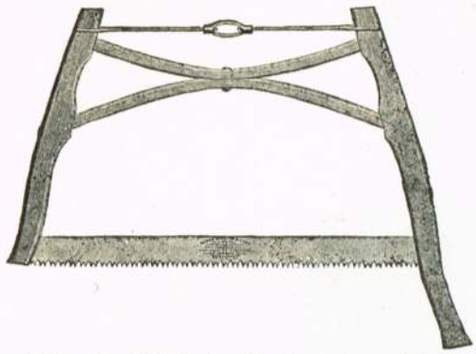

Fig. 1947. No. 80 Disston Arched Frame Wood Saw.
30″ duplex rod, and with No. 77 Blade, 2¾″ wide.
Price **93/9** per doz. Blades, **64/6** per doz.

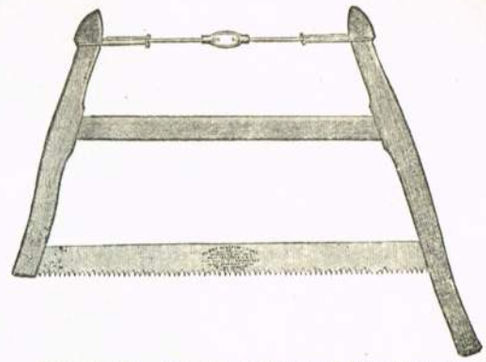

Fig. 1948. No. 77 Disston M Wood Saw.
30″, and with No. 77 blade. Climax rod plain.
Price **83/3** per doz. Blades, **58/3** per doz.

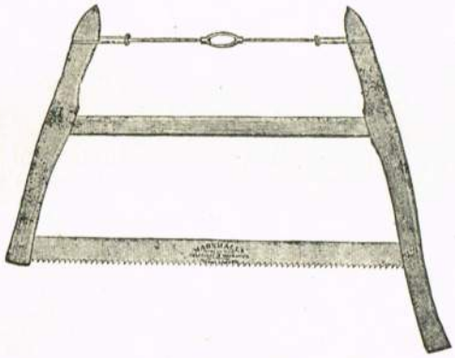

Fig. 1949. No. 3 Marshall Wood Saw.
30″. Clipper loop rod, and No. 3 blade, 2¼″ wide, 4½ points.
Price, **54/3** per doz. Blades, **33**/– per doz.

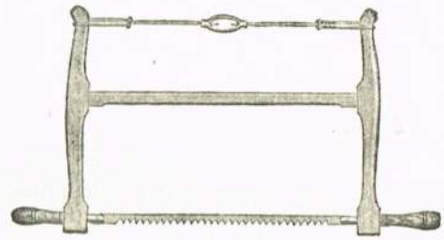

Fig. 1950. Web Saw Frames.

Size	12	14	16	18	20
Frames only, Price per doz.		**£3**	**13**	**3**	(all sizes)
Rods, Price per doz.	**8/8**	**8/9**	**8/11**	**9/1**	**9/2**
Saws, Price per doz.	**10**/–	**10/9**	**12**/–	**14**/–	**14/9**

Size	22	24	26	28	30
Frames only, Price per doz.		**£4**	**2**	**6**	(all sizes)
Rods, Price per doz.	**9/2**	**9/7**	**9/11**	**10/3**	**10/7**
Saws, Price per doz.	**15/3**	**16**/–	**17**/–	**18**/–	**19/3**

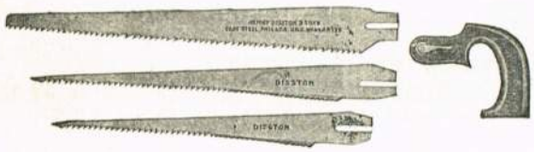

Fig. 1951. Nest of Saws No. 3.
Price complete, **101**/– per doz.
Keyhole blades, 10″, **20**/– doz. Handle and set screw, **14/3** doz.
Compass blades, 14″, **22/6** doz. Pruning blades, 16″, **44/3** doz.

Fig. 1952. Plumbers' Compass Saw No. 8.
With 16 gauge blades.

Size, inches	12	14	16
Price per doz.	**41/3**	**43**/–	**45**/–
Blades, per doz.	**24/3**	**25/9**	**28**/–

Fig. 1953. Disston Duplex Pruning Saw No. 4.
Beech handle. Brass screws.

Size, inches	12	14	16	18	20
Price per doz.	**73/9**	**77**/–	**80/9**	**86/3**	**91/9**

Fig. 1955. Square Hole Saws No. 5.
Price complete, **140/9** per doz.
Handle and set screw, **14/3** doz. Keyhole blades, 10″, **38**/– doz.
Compass blades, 14″, **44/3** doz. Pruning blades, 16″, **44/3** doz.

Fig. 1954. Keyhole Saw, Pad and Turnscrew.
Price complete, **20/6** per doz.
Blades, **11/3** doz. Handles, **9/3** doz.

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T. C. JONES' CAST STEEL CIRCULAR SAWS
FOR WOOD.

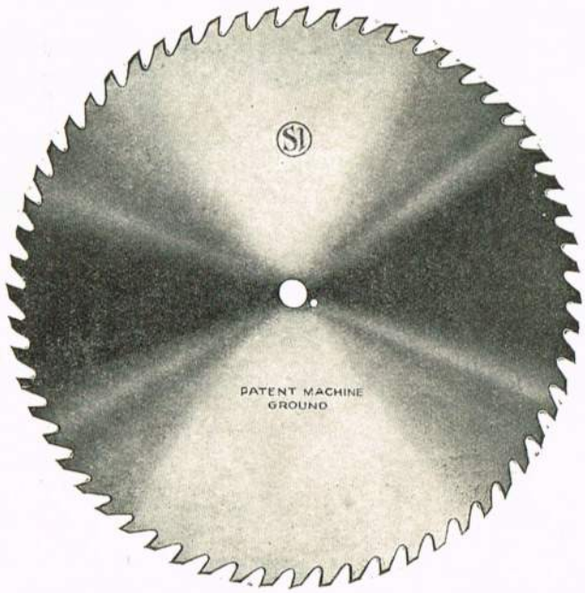

Fig. 1960.

Please give the following particulars when ordering: (1) Diameter; (2) Thickness, B.W.G.; (3) Rubbing of Tooth required; (4) Distance between teeth; (5) Size of Centre hole; (6) Size of Pin hole; (7) Distance between holes; (8) If with key give size or send template

PRICES AND SIZES.

Diameter, inches	4	5	6	7	8	9	10	11	12	14	16	18	20	22	24
Thickness, B.W.G.	21	21	20	19	19	18	18	18	17	17	16	15	14	14	13
Price each	**4/6**	**6/–**	**7/–**	**8/–**	**9/6**	**11/–**	**13/–**	**15/–**	**16/–**	**20/–**	**24/–**	**30/–**	**36/–**	**42/–**	**48/–**
Extra for each gauge thicker ...	**–/3**	**–/6**	**–/6**	**–/6**	**–/9**	**–/9**	**–/9**	**1/–**	**1/3**	**1/6**	**1/9**	**2/–**	**2/6**	**3/–**	**3/6**

Diameter, inches	26	28	30	32	34	36	38	40	42	44	46	48	50	52
Thickness, B.W.G.	13	13	12	12	12	11	11	11	10	10	9	9	8	8
Price each	**56/–**	**66/–**	**76/–**	**88/–**	**104/–**	**120/–**	**145/–**	**160/–**	**180/–**	**215/–**	**240/–**	**270/–**	**380/–**	**420/–**
Extra for each gauge thicker ...	**4/–**	**4/6**	**5/–**	**6/–**	**7/–**	**8/6**	**10/–**	**12/–**	**15/–**	**18/–**	**21/–**	**24/–**	**27/–**	**30/–**

Diameter, inches	54	56	58	60	62	64	66	68	70	72	78	84
Thickness, B.W.G.	7	7	7	6	6	6	6	6	5	5	5	5
Price each	**480/–**	**570/–**	**620/–**	**680/–**	**760/–**	**860/–**	**980/–**	**1100/–**	**1250/–**	**1400/–**	**2100/–**	**2460/–**
Extra for each gauge thicker ...	**35/–**	**40/–**	**45/–**	**50/–**	**55/–**	**60/–**	**65/–**	**70/–**	**80/–**	**90/–**	**140/–**	**160/–**

Fig. 1961. WARRANTED EXTRA QUALITY BAND SAWS. For Wood.

Width, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$...	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{4}$	$2\frac{3}{8}$
Price per yard	**1/2**	**1/2**	**1/4**	**1/6**	**1/8**	**1/10**	**2/–**	**2/4**	**2/8**	**3/–**	**3/4**	**3/8**	**4/–**	**4/4**	**4/8**	**5/–**	**5/3**
Width, inches	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{4}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7	$7\frac{1}{2}$	8
Price per yard	**5/6**	**6/2**	**7/–**	**8/–**	**9/2**	**10/6**	**12/–**	**14/–**	**16/–**	**20/–**	**22/–**	**24/–**	**30/–**	**30/–**	**36/–**	**36/–**

Minimum 4 yards. Portion of a foot charged as one foot.

Fig. 1962. BEST CAST STEEL GROOVING CIRCULAR SAWS. Ground Hollow to Centre.

Thickness, inches	$^1/_{16}$	$\frac{1}{8}$	$^3/_{16}$	$\frac{1}{4}$	$^5/_{16}$	$\frac{3}{8}$	$^7/_{16}$	$\frac{1}{2}$	$^9/_{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Price per inch diameter	**1/3**	**1/6**	**1/10**	**2/–**	**2/2**	**2/5**	**2/7**	**2/9**	**3/–**	**3/2**	**3/5**	**3/7**	**3/10**	**4/8**

Fig. 1963. BAND KNIVES. Best Cast Steel, for cutting Cloth, Paper, etc.

Width, inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price per yard (plain)	**1/2**	**1/4**	**1/6**	**1/8**	**1/10**	**2/–**	**2/8**	**3/4**	**4/8**	**5/6**	**7/–**
,, ,, (wavy)...	**1/9**	**2/–**	**2/3**	**2/6**	**2/9**	**3/–**	—	—	—	—	—

Fig. 1964. BAND SAWS for Cutting Cold Steel and other Metals, Brazed, Set and Sharpened ready for use.

Width, inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$
Price per yard	**2/–**	**2/3**	**2/3**	**2/9**	**3/–**	**3/3**	**4/3**	**5/–**	**5/9**	**6/9**	**7/6**

Minimum 4 yards.

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SAWS.

T. C. JONES' CAST STEEL SWAGED AND GROUND-OFF CIRCULAR SAWS.

Fig. 1965. **Price each.**

34″ DIAMETER.

Gauge at Centre / Depth of Swage	1	2	3	4	5	6	7	8	9
5″ ...	135/0	127/0	124/0	121/0	115/0	110/6	101/6	98/0	95/0
6″ ...	137/0	129/0	126/0	123/0	117/0	112/6	103/6	100/0	97/0
7″ ...	139/0	131/0	128/0	125/0	119/0	114/6	105/6	102/0	99/0
8″ ...	141/0	133/0	130/0	127/0	121/0	116/6	107/6	104/0	101/0
9″ ...	143/0	135/0	132/0	129/0	123/0	118/6	109/6	106/0	103/0
10″ ...	145/0	137/0	134/0	131/0	125/0	120/6	111/6	108/0	105/0
11″ ...	147/0	139/0	136/0	133/0	127/0	122/6	113/6	110/0	107/0
12″ ...	149/0	141/0	138/0	135/0	129/0	124/6	115/6	112/0	109/0
13″ ...	151/0	143/0	140/0	137/0	131/0	126/6	117/6	114/0	111/0
14″ ...	153/0	145/0	142/0	139/0	133/0	128/6	119/6	116/0	113/0

36″ DIAMETER.

Gauge at Centre / Depth of Swage	1	2	3	4	5	6	7	8	9
6″ ...	151/9	145/9	139/9	133/9	128/9	122/9	113/9	108/3	103/9
7″ ...	154/0	148/0	142/0	136/0	131/0	125/0	116/0	110/6	105/0
8″ ...	156/3	150/3	144/3	138/3	133/3	127/3	118/3	112/9	108/3
9″ ...	158/6	152/6	146/6	140/6	135/6	129/6	120/6	115/0	110/6
10″ ...	160/9	154/9	148/9	142/9	137/9	131/9	122/9	117/3	112/9
11″ ...	163/0	157/0	151/0	145/0	140/0	134/0	125/0	119/6	115/0
12″ ...	165/3	159/3	153/3	147/3	142/3	136/3	127/3	121/9	117/3
13″ ...	167/6	161/6	155/6	149/6	144/6	138/6	129/6	124/0	119/6
14″ ...	169/9	163/9	157/9	151/9	146/9	140/9	131/9	126/3	121/9
15″ ...	172/0	166/0	160/0	154/0	149/0	143/0	134/0	128/6	124/0

38″ DIAMETER.

Gauge at Centre / Depth of Swage	1	2	3	4	5	6	7	8
6″ ...	182/9	175/9	170/3	164/3	155/3	149/3	141/3	134/9
7″ ...	185/0	178/0	172/6	166/6	157/6	151/6	143/6	137/0
8″ ...	187/3	180/3	174/9	168/9	159/9	153/9	145/9	139/3
9″ ...	189/6	182/6	177/0	171/0	162/0	156/0	148/0	141/6
10″ ...	191/9	184/9	179/3	173/3	164/3	158/3	150/3	143/9
11″ ...	194/0	187/0	181/6	175/6	166/6	160/6	152/6	146/0
12″ ...	196/3	189/3	183/9	177/9	168/9	162/9	154/9	148/3
13″ ...	198/6	191/6	186/0	180/0	171/0	165/0	157/0	150/6
14″ ...	200/9	193/9	188/3	182/3	173/3	167/3	159/3	152/9
15″ ...	203/0	196/0	190/6	184/6	175/6	169/6	161/6	155/0
16″ ...	205/3	198/3	192/9	186/9	177/9	171/9	163/9	157/3

40″ DIAMETER.

Gauge at Centre / Depth of Swage	1	2	3	4	5	6	7	8
6″ ...	197/6	189/6	183/0	175/6	167/0	161/0	153/6	148/6
7″ ...	200/0	192/0	185/6	178/0	169/6	163/6	156/0	151/0
8″ ...	202/6	194/6	188/0	180/6	172/0	166/0	158/6	153/6
9″ ...	205/0	197/0	190/6	183/0	174/6	168/6	161/0	156/0
10″ ...	207/6	199/6	193/0	185/6	177/0	171/0	163/6	158/6
11″ ...	210/0	202/0	195/6	188/0	179/6	173/6	166/0	161/0
12″ ...	212/6	204/6	198/0	190/6	182/0	176/0	168/6	163/6
13″ ...	215/0	207/0	200/6	193/0	184/6	178/6	171/0	166/0
14″ ...	217/6	209/6	203/0	195/6	187/0	181/0	173/6	168/6
15″ ...	220/0	212/0	205/6	198/0	189/6	183/6	176/0	171/0
16″ ...	222/6	214/6	208/0	200/6	192/0	186/0	178/6	173/6
17″ ...	225/0	217/0	210/6	203/0	194/6	188/6	181/0	176/0

42″ DIAMETER.

Gauge at Centre / Depth of Swage	0	1	2	3	4	5	6	7	8
6″ ...	244/6	223/6	211/6	201/6	196/6	187/6	183/0	178/6	175/0
7″ ...	247/0	226/0	214/0	204/0	199/0	190/0	185/6	181/0	177/6
8″ ...	249/6	228/6	216/6	206/6	201/6	192/6	188/0	183/6	180/0
9″ ...	252/0	231/0	219/0	209/0	204/0	195/0	190/6	186/0	182/6
10″ ...	254/6	233/6	221/6	211/6	206/6	197/6	193/0	188/6	185/0
11″ ...	257/0	236/0	224/0	214/0	209/0	200/0	195/6	191/0	187/6
12″ ...	259/6	238/6	226/6	216/6	211/6	202/6	198/0	193/6	190/0
13″ ...	262/0	241/0	229/0	219/0	214/0	205/0	200/6	196/0	192/6
14″ ...	264/6	243/6	231/6	221/6	216/6	207/6	203/0	198/6	195/0
15″ ...	267/0	246/0	234/0	224/0	219/0	210/0	205/6	201/0	197/6
16″ ...	269/6	248/6	236/6	226/6	221/6	212/6	208/0	203/6	200/0
17″ ...	272/0	251/0	239/0	229/0	224/0	215/0	210/6	206/0	202/6
18″ ...	274/6	253/6	241/6	231/6	226/6	217/6	213/0	208/6	205/0

44″ DIAMETER.

Gauge at Centre / Depth of Swage	0	1	2	3	4	5	6
6″ ...	274/0	261/6	248/6	243/6	238/6	233/0	222/0
7″ ...	276/6	264/0	251/0	246/0	241/0	235/6	224/6
8″ ...	279/0	266/6	253/6	248/6	243/6	238/0	227/0
9″ ...	281/6	269/0	256/0	251/0	246/0	240/6	229/6
10″ ...	284/0	271/6	258/6	253/6	248/6	243/0	232/0
11″ ...	286/6	274/0	261/0	256/0	251/0	245/6	234/6
12″ ...	289/0	276/6	263/6	258/6	253/6	248/0	237/0
13″ ...	291/6	279/0	266/0	261/0	256/0	250/6	239/6
14″ ...	294/0	281/6	268/6	263/6	258/6	253/0	242/0
15″ ...	296/6	284/0	271/0	266/0	261/0	255/6	244/6
16″ ...	299/0	286/6	273/6	268/6	263/6	258/0	247/0
17″ ...	301/6	289/0	276/0	271/0	266/0	260/6	249/6
18″ ...	304/0	291/6	278/6	273/6	268/6	263/0	252/0

46″ DIAMETER.

Gauge at Centre / Depth of Swage	0	1	2	3	4	5	6
6″ ...	294/6	279/6	269/6	257/6	252/6	240/0	232/0
7″ ...	297/6	282/6	272/6	260/6	255/6	243/0	235/0
8″ ...	300/6	285/6	275/6	263/6	258/6	246/0	238/0
9″ ...	303/6	288/6	278/6	266/6	261/6	249/0	241/0
10″ ...	306/6	291/6	281/6	269/6	264/6	252/0	244/0
11″ ...	309/6	294/6	284/6	272/6	267/6	255/0	247/0
12″ ...	312/6	297/6	287/6	275/6	270/6	258/0	250/0
13″ ...	315/6	300/6	290/6	278/6	273/6	261/0	253/0
14″ ...	318/6	303/6	293/6	281/6	276/6	264/0	256/0
15″ ...	321/6	306/6	296/6	284/6	279/6	267/0	259/0
16″ ...	324/6	309/6	299/6	287/6	282/6	270/0	262/0
17″ ...	327/6	312/6	302/6	290/6	285/6	273/0	265/0
18″ ...	330/6	315/6	305/6	293/6	288/6	276/0	268/0

48″ DIAMETER.

Gauge at Centre / Depth of Swage	0	1	2	3	4	5	6
6″ ...	330/6	306/0	290/6	278/0	271/6	259/6	248/0
7″ ...	333/6	309/0	293/6	281/0	274/6	262/6	251/0
8″ ...	336/6	312/0	296/6	284/0	277/6	265/6	254/0
9″ ...	339/6	315/0	299/6	287/0	280/6	268/6	257/0
10″ ...	342/6	318/0	302/6	290/0	283/6	271/6	260/0
11″ ...	345/6	321/0	305/6	293/0	286/6	274/6	263/0
12″ ...	348/6	324/0	308/6	296/0	289/6	277/6	266/0
13″ ...	351/6	327/0	311/6	299/0	292/6	280/6	269/0
14″ ...	354/6	330/0	314/6	302/0	295/6	283/6	272/0
15″ ...	357/6	333/0	317/6	305/0	298/6	286/6	275/0
16″ ...	360/6	336/0	320/6	308/0	301/6	289/6	278/0
17″ ...	363/6	339/0	323/6	311/0	304/6	292/6	281/0
18″ ...	366/6	342/0	326/6	314/0	307/6	295/6	284/0

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SAWS.

T. C. JONES' CAST STEEL SWAGED AND GROUND-OFF CIRCULAR SAWS.

Fig. 1966.

Please give the following particulars when ordering :—

(1) Diameter. (2) Thickness in Centre, and (3) On tooth. (4) Depth of Swage or bevel. (5) Whether bevelled on right or left (illustration is left hand). (6) Size of centre hole. (7) Size of pin hole. (8) Distance between holes. (9) If with Keyway, state size or send template. (10) Nature of wood to be cut. (11) Revolutions per minute.

Prices are based on Saws 19 gauge at tooth ; if ground thinner add 6d. per foot extra for each gauge thinner.

Price Each.

18in. DIAMETER.

Gauge at Centre— Depth of Swage.	5	6	7	8	9	10	11	12
3″	39/–	38/–	36/6	35/–	32/6	31/6	30/6	29/–
4″	40/–	39/–	37/6	36/–	33/6	32/6	31/6	30/–
5″	41/–	40/–	38/–	37/–	34/6	33/6	32/6	31/–
6″	42/–	41/–	39/6	38/–	35/6	34/6	33/6	32/–

20in. DIAMETER.

Gauge at Centre— Depth of Swage.	5	6	7	8	9	10	11	12
3″	47/–	45/–	43/–	41/–	39/6	38/–	36/9	35/6
4″	48/3	46/3	44/3	42/3	40/9	39/3	38/–	36/9
5″	49/6	47/6	45/6	43/6	42/–	40/6	39/3	38/–
6″	50/9	48/9	46/9	44/9	43/3	41/9	40/6	39/3
7″	52/–	50/–	48/–	46/–	44/6	43/–	41/9	40/6

22in. DIAMETER.

Gauge at Centre— Depth of Swage.	6	7	8	9	10	11	12
3″	49/–	46/6	44/–	42/6	41/–	39/6	38/–
4″	50/6	48/–	45/6	44/–	42/6	41/–	39/6
5″	52/–	49/6	47/–	45/6	44/–	42/6	41/–
6″	53/6	51/–	48/6	47/–	45/6	44/–	42/6
7″	55/–	52/6	50/–	48/6	47/–	45/6	44/–
8″	56/6	54/–	51/6	50/–	48/6	47/–	45/6

24in. DIAMETER.

Gauge at Centre— Depth of Swage.	4	5	6	7	8	9	10
3″	61/6	58/6	56/–	54/6	50/6	49/6	47/6
4″	63/–	60/–	57/6	56/–	52/–	51/–	49/–
5″	64/6	61/6	59/–	57/6	53/6	52/6	50/6
6″	66/–	63/–	60/6	59/–	55/–	54/–	52/–
7″	67/6	64/6	62/–	60/6	56/6	55/6	53/6
8″	69/–	66/–	63/6	62/–	58/–	57/–	55/–
9″	70/6	67/6	65/–	63/6	59/6	58/6	56/6

26in. DIAMETER.

Gauge at Centre— Depth of Swage.	4	5	6	7	8	9	10
3″	76/6	70/6	68/6	65/–	63/–	59/6	57/6
4″	78/3	72/3	70/3	66/9	64/9	61/3	59/3
5″	80/–	74/–	72/–	68/6	66/6	63/–	61/–
6″	81/9	75/9	73/9	70/3	68/3	64/9	62/9
7″	83/6	77/6	75/6	72/–	70/–	66/6	64/6
8″	85/3	79/3	77/3	73/9	71/9	68/3	66/3
9″	87/–	81/–	79/–	75/6	73/6	70/–	68/–
10″	88/9	82/9	80/9	77/3	75/3	71/9	69/9

28in. DIAMETER.

Gauge at Centre— Depth of Swage.	4	5	6	7	8	9	10
4″	85/9	83/3	78/3	74/3	71/9	69/9	65/3
5″	87/6	85/–	80/–	76/–	73/6	71/6	67/–
6″	89/3	86/9	81/9	77/9	75/3	73/3	68/9
7″	91/–	88/6	83/6	79/6	77/–	75/–	70/6
8″	92/9	90/3	85/3	81/3	78/9	76/9	72/3
9″	94/6	92/–	87/–	83/–	80/6	78/6	74/–
10″	96/3	93/9	88/9	84/9	82/3	80/3	75/9
11″	98/–	95/6	90/6	86/6	85/–	82/–	77/6

30in. DIAMETER.

Gauge at Centre— Depth of Swage.	2	3	4	5	6	7	8	9	10
5″ ...	105/–	100/–	97/–	92/–	88/6	85/–	78/6	76/6	74/–
6″ ...	107/–	102/–	99/–	94/–	90/6	87/–	80/6	78/6	76/–
7″ ...	109/–	104/–	101/–	96/–	92/6	89/–	82/6	80/6	78/–
8″ ...	111/–	106/–	103/–	98/–	94/6	91/–	84/6	82/6	80/–
9″ ...	113/–	108/–	105/–	100/–	96/6	93/–	86/6	84/6	82/–
10″ ...	115/–	110/–	107/–	102/–	98/6	95/–	88/6	86/6	84/–
11″ ...	117/–	112/–	109/–	104/–	100/6	97/–	90/6	88/6	86/–
12″ ...	119/–	114/–	111/–	106/–	102/6	99/–	92/6	90/6	88/–

32in. DIAMETER.

Gauge at Centre— Depth of Swage.	1	2	3	4	5	6	7	8	9
5″ ...	126/–	120/–	115/–	110/–	104/6	101/–	93/–	90/–	86/6
6″ ...	128/–	122/–	117/–	112/–	106/6	103/–	95/–	92/–	88/6
7″ ...	130/–	124/–	119/–	114/–	108/6	105/–	97/–	94/–	90/6
8″ ...	132/–	126/–	121/–	116/–	110/6	107/–	99/–	96/–	92/6
9″ ...	134/–	128/–	123/–	118/–	112/6	109/–	101/–	98/–	94/6
10″ ...	136/–	130/–	125/–	120/–	114/6	111/–	103/–	100/–	96/6
11″ ...	138/–	132/–	127/–	122/–	116/6	113/–	105/–	102/–	98/6
12″ ...	140/–	124/–	129/–	124/–	118/6	115/–	107/–	104/–	100/6
13″ ...	142/–	136/–	131/–	126/–	120/6	117/–	109/–	106/–	102/6

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CIRCULAR SAWS.

Fig. 1967. Solid Tooth Circular Saw.

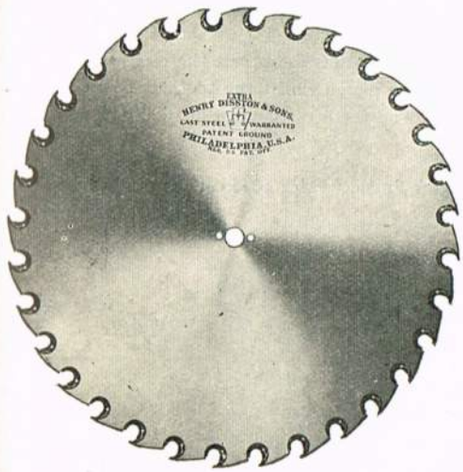
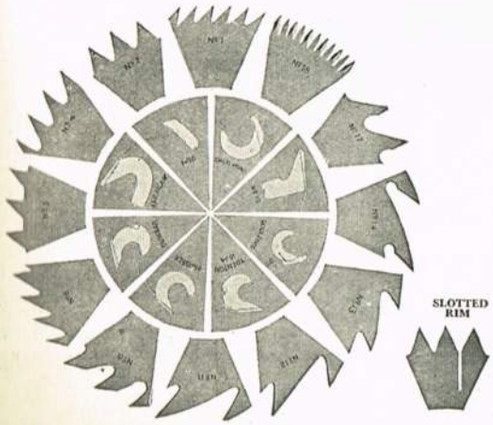


Fig. 1968. Inserted Chisel Point Circular Saw.



Illustrations of various types of teeth for Circular Saws.

Cross Cutting—Nos. 2, 4, 5, and 17.
Ripping Cutting—Nos. 11, 12, 13 and 14.
Ripping or Cross Cutting—Nos. 1, 6 and 8.
Mitreing or Cross Cutting—No. 18.

SOLID TOOTH CIRCULAR SAWS.

Extra quality. Ground and tempered.

Diam. ins.	Thickness gauge	Size of hole ins.	Price each £ s. d.	Extra for each additional gauge heavier £ s. d.
6	18	$\frac{3}{4}$	0 12 6	0 0 3
8	18	$\frac{7}{8}$	0 16 9	0 0 5
10	16	1	1 1 3	0 0 9
12	15	1	1 6 6	0 1 3
14	14	$1\frac{1}{8}$	1 12 3	0 1 6
16	14	$1\frac{1}{8}$	2 0 0	0 2 0
18	13	$1\frac{1}{4}$	2 7 6	0 2 3
20	13	$1^5/_{16}$	2 17 0	0 2 9
22	12	$1^5/_{16}$	3 6 6	0 3 6
24	11	$1\frac{3}{8}$	3 18 0	0 4 0
26	11	$1\frac{3}{8}$	4 11 3	0 4 9
28	10	$1\frac{1}{2}$	5 6 3	0 5 9
30	10	$1\frac{1}{2}$	6 1 6	0 6 9
32	10	$1\frac{5}{8}$	6 15 9	0 7 6
34	9	$1\frac{5}{8}$	7 15 9	0 8 6
36	9	$1\frac{5}{8}$	6 18 6	0 10 0
38	9	$1\frac{5}{8}$	10 5 3	0 11 3
40	9	2	11 15 6	0 13 0
42	8	2	13 19 9	0 14 6
44	8	2	15 15 6	0 16 9
46	8	2	18 12 3	0 19 6
48	8	2	21 5 6	1 2 6
50	7	2	24 2 6	1 5 3
52	7	2	26 19 6	1 8 0
54	7	2	29 19 6	1 13 6
56	7	2	34 4 0	1 18 9
58	7	2	38 0 0	2 4 6
60	6	2	42 11 3	2 10 0
62	6	2	47 10 0	2 16 0
64	6	2	53 4 0	3 7 0
66	6	2	58 18 0	4 3 6
68	5	2	66 10 0	5 0 3
70	5	2	76 0 0	5 17 0
72	5	2	85 10 0	6 13 9
74	5	2	96 18 0	7 10 6
76	5	2	109 4 3	8 7 3

INSERTED CHISEL POINT CIRCULAR SAWS.

Diam. ins.	Thickness gauge	No. of teeth	Size of hole ins.	Price each £ s. d.
16	10	12	$1\frac{1}{8}$	7 0 6
18	10	14	$1\frac{1}{4}$	7 18 3
20	9	14	$1^5/_{16}$	9 0 0
22	9	16	$1^5/_{16}$	10 1 9
24	9	18	$1\frac{3}{8}$	11 3 3
26	9	18	$1\frac{3}{8}$	12 4 9
28	9	18	$1\frac{1}{2}$	13 6 9
30	9	20	$1\frac{1}{2}$	14 8 0
32	8	22	$1\frac{5}{8}$	15 6 9
34	8	22	$1\frac{5}{8}$	17 9 3
36	8	24	$1\frac{5}{8}$	19 1 6
38	8	24	$1\frac{5}{8}$	20 14 0
40	8	26	2	22 10 0
42	8	28	2	24 13 3
44	8	30	2	27 0 0
46	8	32	2	29 14 0
48	8	34	2	32 8 0
54	7	40	2	45 0 0
60	7	46	2	61 4 0
66	6	50	2	84 12 0
72	6	56	2	111 12 0

Included with each saw are: One extra set of teeth or bits, two extra holders, or shanks, and wrench.

Duplicate Points, No. 2	**31/3** per 100
" " No. 3	**30/–** "
Duplicate Holders	**2/8** each

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SAW SETS. MITRE CUTTERS.

Fig. 1969. Disston's " Monarch " Saw Set.

Specially adapted for Hand Saws, Crosscut Saws, Circular and all small Saws.

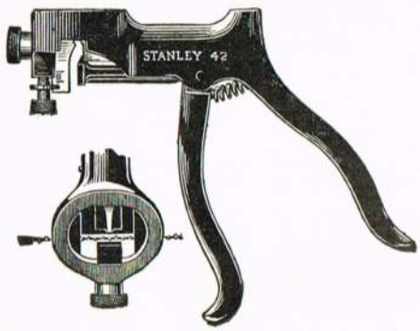
Specially adapted for setting Saws ¾ inch and wider.

	No. 2 Small.	12 Medium.	20 Large.
Prices per dozen	**58/3**	**82/6**	**125/–**

Fig. 1970. Disston's " Triumph " Saw Set.

Principal feature is the use of two plungers operated by both handles, causing " D " plunger to be forced against the body of the Saw, holding it firmly in position, whilst " C " plunger sets the tooth.

		Price, doz.
No. 8	Large for Circular and Cross-cut Saws 12 gauge and lighter,	**133/3**
,, 18	Med. ,, ,, 14 ,, ,,	**98/3**
,, 28	Small for Hand, Back, Web, and Narrow Band Saws	**74/3**
,, 280	Small for Hand, Back, Web Butcher Saw Blades, from 10 to 16 points	**74/3**



Stanley " Pistol Grip " Adjustable Saw Sets. No. S42.

The Shape of the body and handle enables the user to operate the tool with great ease. The Saw is held firmly in position against the gauge whilst the tooth is being set. This set is suitable for Back and Panel Saws. The teeth of Saw are in plain view, enabling adjustment to be made to suit.

Weight, each, 16 oz. Black finish. Price **10/6** each.

Fig. 1972. Improved Corner Cramp.

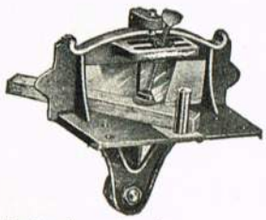
Fitted with cast iron body and jaws. With mild steel screws.

Nos.	1	2	3
Size of moulding, inches	1¼	2¼	4
Price per dozen	**32/–**	**39/–**	**52/–**

Fig. 1973. MITRE CUTTER.

This machine has been designed and patented to supply a long-felt want, namely, a perfectly true and accurate tool which will produce an exact angle or mitre of 45 degrees.

There are two reasons for a mitre cutting machine producing an untrue mitre. The first is the use of moulding which is not straight on the back from which it takes its bearing or seating in the frame to be operated upon. It is therefore primarily necessary to see before use that the moulding is straight on the back. This is a matter for the user. The second is the absolute necessity of the moulding remaining in one position, i.e., that it shall not be allowed to move in the slightest degree while being cut. After exhaustive tests it has been found that it is a very difficult matter to hold the moulding so firmly with the one hand that it does not move to a greater or less degree while being cut, although almost imperceptibly. This difficulty has been overcome in the case of the Patent " Imperial " mitre cutter by an attachment arranged at the back of the machine which contains a self-adjusting screw, fitted with an india-rubber pad, by which means the moulding, when in position, is immediately and firmly held in an immovable position for cutting, as shewn in illustration.



Back view, shewing attachment to keep the moulding perfectly immovable.

The whole of the working parts of the Patent " Imperial " Mitre Cutter are machined, the cutter arm carrying the knives is jointed and held down in a quadrant, and while the arm works freely, it is impossible for the knives when operating to leave the face of the machine on which they have their bearing ; the knives are made in halves and are ground up perfectly true after hardening, each half being held in position by two screws, which, when released, enable either the right or left hand knife to be removed, sharpened, and replaced with the greatest possible ease without interfering with any other part of the machine.

All parts are interchangeable, and can be supplied.

All " Imperial " Mitre Cutters are carefully tested before being sent out, and guaranteed to cut a true angle of 45 degrees.

Size No. 1.	To take in mouldings up to 2⅛″ wide	**34/–** each
Size No. 2.	,, ,, ,, 4¼″ ,, ...	**51/9** ,,

Extra knives.—No. 1 size, **5/–** each half knife ; No. 2 size, **7/–** each half knife.

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BAND SAW BRAZER.

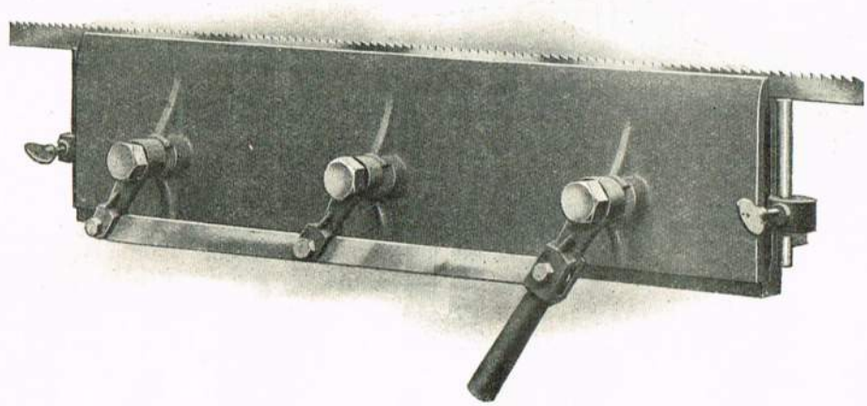

Fig. 1980

The above illustration represents the latest production in a vice for firmly gripping band saws for sharpening. Made of best close grain cast iron, 24″ jaws accurately machined, having bevelled edge tops. Fitted with heavy design quick release action, the saw is instantly gripped and released. Two distance pins are fitted at each end to gauge the depth of cut for repetition sharpening. It can be used for band saws up to 4″ wide.

Price £4 0 0

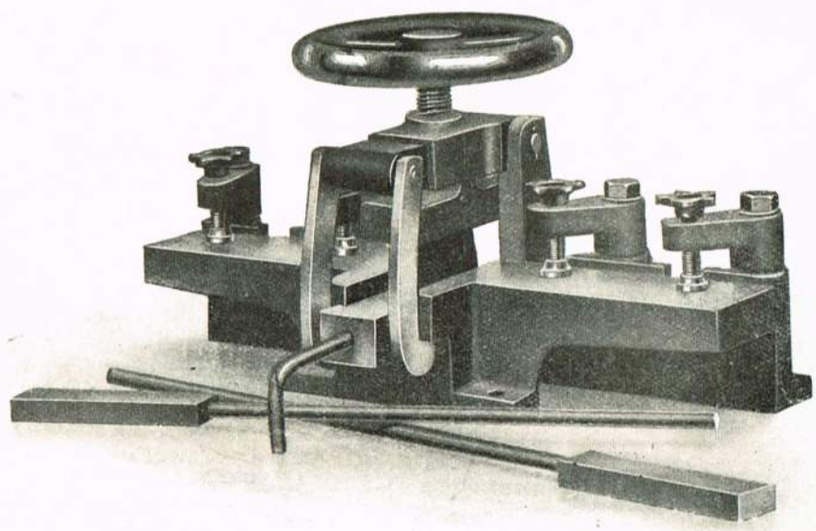

Fig. 1981.

T. C. JONES' "CHELMSFORD" BAND SAW BRAZER.

An indispensable machine in every well-equipped workshop. Absolutely faultless in operation.

Comprising a heavy cast iron base, and centre cast iron adjustable wedge. Wheel screw fitted to cast iron plunger and two wrought steel drop hooks. Four thumb screws for holding down the band saw. Fitted with adjustable swivel arms and two mild steel heating irons with handles. In this machine the joints are firmly held in a straight position. Designed for fixing to bench.

Price £10 0 0

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MACHINE KNIVES, Etc.

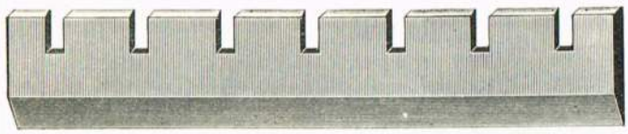

Fig. 2100. Guillotine Knives.

All patterns of machine knives supplied and made of best quality steel to suit customers' requirements. Prices upon application.

Fig. 2101. Planing and Thicknessing Machine Irons.

Fig. 2102. Square Irons.

Fig. 2102. Side Irons.

Fig. 2103. Grooving Irons.

Fig. 2104. Tongueing Irons.

Fig. 2105. HOLLOW SQUARE CHISELS AND AUGERS.

	STANDARD DIMENSIONS.					PRICES.	
	A	B	C	D	E	Chisels	Augers
	In.	In.	In.	In.	In.	only	only
$\frac{1}{4}$	$\frac{13}{16}$	$1\frac{5}{8}$	$\frac{3}{16}$	$3\frac{7}{8}$	$4\frac{1}{4}$	**15/6**	**4/6**
$\frac{5}{16}$	$\frac{13}{16}$	$1\frac{5}{8}$	$\frac{3}{16}$	$3\frac{7}{8}$	$4\frac{1}{4}$	**15/6**	**4/6**
$\frac{3}{8}$	$\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{4}$	$3\frac{7}{8}$	$4\frac{1}{4}$	**15/6**	**4/6**
$\frac{7}{16}$	$\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{4}$	$3\frac{7}{8}$	$4\frac{1}{4}$	**16/6**	**4/6**
$\frac{1}{2}$	$\frac{13}{16}$	$1\frac{5}{8}$	$\frac{3}{8}$	$3\frac{7}{8}$	$4\frac{1}{4}$	**18/–**	**4/6**
$\frac{9}{16}$	$\frac{13}{16}$	$1\frac{5}{8}$	$\frac{3}{8}$	$3\frac{7}{8}$	$4\frac{1}{4}$	**19/6**	**5/–**
$\frac{5}{8}$	$1\frac{3}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**30/–**	**6/3**
$\frac{11}{16}$	$1\frac{3}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**31/–**	**6/9**
$\frac{3}{4}$	$1\frac{3}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**31/6**	**7/–**
$\frac{13}{16}$	$1\frac{3}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**32/6**	**7/9**
$\frac{7}{8}$	$1\frac{3}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**33/–**	**7/9**
$\frac{15}{16}$	$1\frac{3}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**34/–**	**8/9**
1	$1\frac{3}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**35/–**	**8/9**

	STANDARD DIMENSIONS.					PRICES.	
	A	B	C	D	E	Chisels	Augers
	In.	In.	In.	In.	In.	only	only
$1\frac{1}{8}$	$1\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**39/–**	**9/6**
$1\frac{1}{4}$	$1\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**42/–**	**10/9**
$1\frac{3}{8}$	$1\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**48/–**	**11/3**
$1\frac{1}{2}$	$1\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	$3\frac{7}{8}$	6	**53/–**	**13/–**
$1\frac{5}{8}$	$2\frac{5}{16}$	2	$\frac{3}{4}$	$5\frac{1}{4}$	8	**61/6**	**13/6**
$1\frac{3}{4}$	$2\frac{5}{16}$	2	$\frac{3}{4}$	$5\frac{1}{4}$	8	**64/6**	**14/–**
$1\frac{7}{8}$	$2\frac{5}{16}$	2	$\frac{3}{4}$	$5\frac{1}{4}$	8	**68/6**	**16/–**
2	$2\frac{5}{16}$	2	$\frac{3}{4}$	$5\frac{1}{4}$	8	**72/–**	**17/–**

These are standard sizes. When Hollow Chisels and Bits having special diameter shank are ordered, we recommend that a Collet or Bushing be used, which can be supplied at a small extra cost.

Fig. 2108. Millers Falls Monitor No. 100 Glass Cutter. Cocobola handle, turret of steel, held in position by knurled thumb on back, provided with several wheels which can easily be removed.

Price, **23**/– dozen.

Fig. 2109. Millers Falls No. 7 Single Wheel Glass Cutter. Iron handle, flattened to give easy grip.

Pirce, **4/8** dozen.

Fig. 2110. Glass Tube Cutter No. 218.—This Cutter is $12\frac{1}{2}$ inches long over all, provided with a Graduated Steel Beam, $6\frac{1}{2}$ inches long, with a Gauge Stop that can be set at any desired point. The Cutter Wheel is honed and tested ; and as it can be easily replaced as it becomes dull, the tool will always be in a serviceable condition. The Beams of this tool are nickel plated and the handles finished in red enamel. Net weight, **10** ozs.

Price, **5/5** each.

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DIAMOND TOOLS.

FOR DRESSING GRINDING WHEELS. ALL WARRANTED.

Fig. 2111. FOR HAND USE. Steel, ½″ diameter.

No. 1, **27/6** each. No. 2, **35**/– each. No. 3, **50**/– each. No. 4, **65**/– each. No. 5, **85**/– each.

Fig. 2112. KNURLED END PATTERN. Size 8″ × ½″.

No. 0, **27/6** each. No. 1, **35**/– each. No. 2, **50**/– each. No. 3, **65**/– each. No. 4, **85**/– each. No. 5, **105**/- each. No. 6, **120**/- each.

Fig. 2113. LATHE DIAMOND. Size 7″ × 1″ × ½″.

No. 1, **47/6** each. No. 2, **63**/– each. No. 3, **90**/– each. No. 4, **120**/– each.

Fig. 2114. FOR NORTON GRINDERS.

Size	0	1	2	3	4
Price each ...	**35**/–	**50**/–	**65**/–	**85**/–	**105**/–

Fig. 2115. WITH MORSE TAPER STUD.

Size	0	1	2	3	4
Price each ...	**27/6**	**35**/–	**50**/–	**65**/–	**85**/–

Fig. 2116. FOR LANDIS GRINDERS.

Size	0	1	2	3	4
Price each ...	**35**/–	**50**/–	**65**/–	**85**/–	**105**/–

Fig. 2117. DIAMONDS FOR CUTTING PLATE GLASS.

Size D, **22/6** each. Size C, **26**/– each. Size B, **31/6** each. Size A, **37/6** each.

Fig. 2118. DIAMOND PENCILS FOR MARKING GLASS.

Size B ... **5**/– each. Size A ... **7/6** each.

Fig. 2119. DIAMONDS FOR CUTTING GAUGE GLASSES.

Size C ... **13/6** each. Size B ... **16/6** each. Size A ... **21**/– each.

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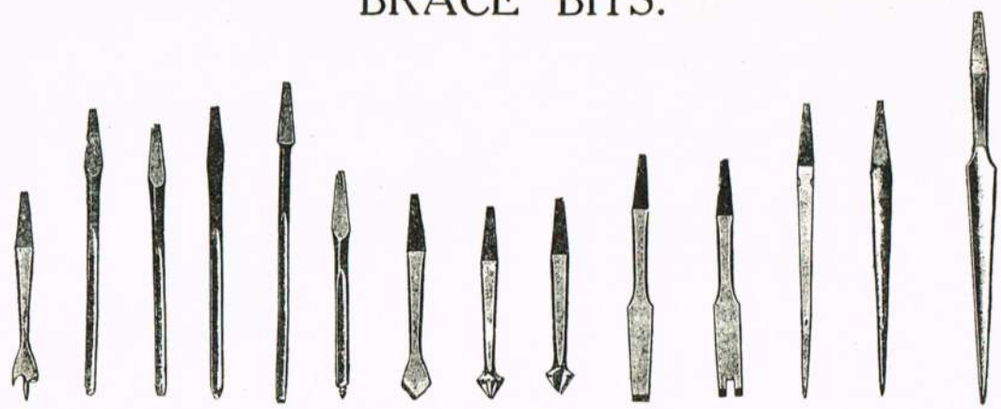
BRACE BITS.



Figs. 1990. 1991. 1992. 1993. 1994. 1995. 1996. 1997. 1998. 1999. 2000. 2001. 2002. 2003.

Fig. 1990. CENTRE BITS.

Size	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8 in.
Black	4/-	4/-	4/-	4/6	4/6	4/9	4/9	5/-	5/-	5/6	5/6	6/-	6/-	7/-	8/-	9/-	10/-	11/-	12/6	14/-	16/-	20/- doz.

Size ... ... Up to	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8	3 1/4	3 3/8	3 1/2 in.
With two nickers...	26/-	29/-	33/-	37/-	42/-	47/-	52/-	58/-	64/-	70/-	76/- doz.

Screw Pin Centre Bits	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1	1 1/8	1 1/4	1 3/8	1 1/2 in.
Fig. 2004	6/-	6/6	6/6	6/9	6/9	7/-	7/-	7/6	7/6	8/-	8/-	9/-	10/-	11/-	12/- doz.

Centre Plug Bits... ...	1	1 1/8	1 1/4	1 3/8	1 1/2 in.
Fig. 2005	14/6	16/-	18/-	21/-	24/- doz.

Centre Cock Bits ...	5/8	3/4	7/8	1	1 1/8	1 1/4 in.
Fig. 2006 ...	20/-	22/-	24/-	28/-	33/- doz.	

Size	1/16	3/32	1/8	5/32	3/16	7/32	1/4	9/32	5/16	3/8	7/16	1/2	Asstd. 1/8 to 3/8 in.
Fig. 1992. Shell or Pin Bits...	6/8	6/8	4/8	4/8	4/8	4/8	4/8	5/-	5/-	5/6	6/6	8/-	4/10 doz.
Fig. 1993. Spoon ,, ...	6/8	6/8	4/8	4/8	4/10	4/10	5/-	5/2	5/6	5/10	6/6	—	5/6 ,,
Fig. 1991. Nose ,, ...	6/8	6/8	4/8	4/8	4/10	4/10	5/-	5/2	5/6	5/10	6/6	—	5/6 ,,
Fig. 1994. Sash ,, ...	—	—	—	—	5/6	—	5/6	—	6/-	6/6	7/6	8/6	— ,,

Size	1/4	3/8	1/2	5/8	3/4	7/8	1 in.
Fig. 1999. Turnscrew Bits, Plain	4/-	4/-	4/6	5/6	7/-	8/6	10/- doz.
Fig. 2000. ,, ,, Forked	4/6	4/6	5/-	6/6	8/-	9/6	11/- ,,
Fig. 1996. Countersink Bits, Flat	—	4/6	4/6	5/6	7/6	11/-	14/- ,,
Fig. 1998. ,, ,, Snail	—	5/-	5/-	6/-	9/-	13/-	16/- ,,
Fig. 1997. ,, ,, Rose	—	5/-	5/-	7/-	10/6	14/6	17/- ,,

Fig. 2007. PIANOFORTE BITS.

Up to	1/4	9/32	5/16	11/32	3/8 in.
	5/6	5/8	5/10	6/-	6/2 doz.

Fig. 2008. COOPERS' DOWEL BITS.

Size up to	5/16	3/8	7/16	1/2 in.
Flat of Square Tangs...	4/-	4/6	5/6	6/6 doz.

Fig. 2009. CHAIR BITS.

Size... ...	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4 in.
Price ...	4/6	5/-	6/-	7/-	8/-	9/-	10/-	12/- doz.

Fig. 2010. BRUSH BITS.

No.	0 to 12	13	14	15	16	17	18	19	20
	4/6	4/9	5/-	5/6	6/-	6/6	7/-	7/6	8/- doz.

Fig. 2003. TAPER BITS.

Up to	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2 in.
	7/6	9/6	11/6	13/6	18/-	24/-	28/-	32/- doz.

	3/8	7/16	1/2	5/8	3/4	7/8	1 in.
Fig. 2001. Rimer Bits, Square ...	5/-	12/-	16/-	20/-	24/-	30/-	36/- doz.
Fig. 2002. ,, ,, Half-round	5/-	5/-	5/-	12/-	16/-	20/-	24/- ,,
Boxwood handled Square Rimers, Bright	11/-	—	—	—	—	—	— ,,
Boxwood handled Taper Bits, Bright	—	—	—	13/-	—	—	— ,,

Fig. 1995. GIMLET BITS.

Up to	1/4	5/16	3/8 in.
Shell	5/9	6/9	7/9 doz.
Twist	6/9	7/9	8/9 ,,

Fig. 2020.
MILLERS FALLS IRWIN PATTERN AUGER BITS.

The distinguishing feature of this bit is its solid centre. ighly polished overall. Length 9 inches. Sizes in sixteenths an inch.

ze	3	4	5	6	7	8	9	10
ice	18/9	16/8	16/8	16/8	18/9	20/10	22/11	25/- doz.

ze	11	12	13	14	15	16	17
ice	29/2	29/2	33/4	33/4	37/6	37/6	43/9 doz.

ze	18	19	20	21	22	23	24
ice	43/9	50/-	50/-	56/3	56/3	62/6	62/6 doz.

Fig. 2030.
MILLERS FALLS EXTENSION BIT.

This extension has a steel band over the end of the chuck. This reinforces and gives it added strength.

Will follow an 11/16 bit or larger, but not guaranteed when used with bits over 12/16.

Length ...	12 in.	15 in.	18 in.	21 in.	24 in.	30 in.
Weight, each	10 oz.	11 0z.	13 oz.	14 oz.	16 oz.	18 oz.
Price, each...	9/2	9/5	9/6	9/10	10/2	10/10

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AUGERS, ETC.

Fig. 2130. Bright Scotch Screw Augers.

Fig. 2131. Gedge's Pattern Augers.

Size	$\frac{1}{4}$—$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	inch
Fig. 2130. Scotch—																		
Eyed as shown ...	**1/11**	**2/2**	**2/8**	**2/11**	**3/3**	**3/8**	**4/2**	**4/6**	**5/–**	**5/4**	**6/–**	**6/5**	**7/1**	**10/6**	**13/4**	**18/4**	**25/8**	each
Tanged	**1/6**	**1/9**	**2/2**	**2/5**	**2/8**	**3/–**	**3/5**	**3/8**	**4/2**	**4/5**	**5/–**	**5/4**	**5/11**	—	—	—	—	,,
Fig. 2131. Gedge's—																		
Eyed as shown ...	**1/11**	**2/2**	**2/8**	**2/11**	**3/3**	**3/8**	**4/2**	**4/6**	**5/–**	**5/4**	**6/–**	**6/5**	**7/1**	**10/6**	**14/2**	**18/4**	**23/4**	,,
Tanged	**1/7**	**1/10**	**2/2**	**2/5**	**2/8**	**3/–**	**3/5**	**3/9**	**4/3**	**4/8**	**5/3**	**5/6**	**5/11**	**8/–**	**13/4**	**16/3**	**21/8**	,,

Fig. 2132. Clark Pattern Improved Expansion Bit.

	Price, each.
A—Small Size, with 2 Cutters, boring from $\frac{5}{8}$ to $1\frac{3}{4}$ in. ...	**6/3**
Extra Cutters, No. 1, cutting $\frac{1}{2}$ to $\frac{7}{8}$ in.	**1/2**
,, ,, 2, ,, $\frac{7}{8}$ to $1\frac{1}{2}$ in.	**1/4**
,, ,, 3, ,, $\frac{7}{8}$ to $1\frac{3}{4}$ in.	**1/10**
,, ,, 4, ,, $1\frac{3}{4}$ to 3 in.	**2/1**

	Price, each
B—Large Size, with 2 Cutters, boring from $\frac{7}{8}$ to 3 in. ...	**9/3**
Extra Cutters, No. 5, cutting 3 to 4 in.	**3/3**
,, ,, 6, ,, $3\frac{1}{2}$ to 5 in.	**4/3**
,, ,, 7, ,, $4\frac{1}{2}$ to 6 in.	**5/3**

Fig. 2133. Forstner Auger Bits, for Smooth, Round, Oval or Square Boring, Scroll and Twist Work. The Forstner Auger Bit is guided by its circular rim. It leaves a clean and true surface.

Size ...	$\frac{1}{4}$, $\frac{5}{16}$	$\frac{3}{8}$, $\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$, $\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$, $\frac{7}{8}$	$\frac{15}{16}$, 1	$1\frac{1}{16}$, $1\frac{1}{8}$	$1\frac{3}{16}$	$1\frac{1}{4}$, $1\frac{5}{16}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{1}{2}$, $1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	in.
Price	**3/9**	**4/2**	**4/6**	**4/10**	**5/–**	**5/6**	**5/10**	**7/1**	**7/6**	**8/3**	**9/3**	**9/10**	**11/–**	**12/6**	**14/–**	**15/–**	**16/1**	each

Larger sizes supplied to order.

Fig. 2134. Best Cast Steel Twist Spike Gimlets.

Size	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	inch
Price	**7/–**	**10/–**	**12/6**	**16/–**	**19/6**	doz.

Fig. 2135. Best Cast Steel Shell Spike Gimlets.

Size	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	inch
Price	**5/–**	**8/6**	**11/–**	**14/6**	**18/6**	doz.

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PUTTY KNIVES, Etc.

Fig. 2136. STIFF SPEAR NOTCHED PUTTY KNIFE.

Plain cocoa handle.

Size, inches ...	4	4½	5
Price each ...	**1/3½**	**1/4**	**1/5½**

Fig. 2137. STIFF SPEAR PUTTY KNIFE.

Plain cocoa handle.

Size, inches ...	4	4½	5
Price each ...	**1/3½**	**1/4**	**1/5½**

Fig. 2138. ELASTIC CLIP EBONY HANDLE.

Size, inches ...	4	4½	5
Price each ...	**1/5½**	**1/6**	**1/7½**

Fig. 2139. STEEL CHISEL PUTTY KNIFE.

Ebony handle.

Size, inches	5×1½	5×2
Price each	**1/11½**	**2/1½**

Fig. 2140. HACKING KNIVES.

Leather scales.

Size 4″ ... . **1/4½** each.

Fig. 2141. CHIPPING KNIVES.

Size, inches	5×1¾	6×1¾
Price each	**2/10**	**3/2½**

Fig. 2142. PALETTE KNIVES. Scale Tang.

Cocoa handle.

Size, inches	3	4	5	6	7
Price per dozen ...	**15/6**	**16/6**	**18/–**	**20/6**	**25/6**
Size, inches	8	9	10	11	12
Price per dozen ...	**29/–**	**36/6**	**44/–**	**51/6**	**63/6**

Fig. 2149. FILE HANDLE No. 448.

While this handle holds perfectly files with tangs of all sizes and shapes, and is primarily a file handle, yet it also holds a variety of shanks of different shapes and sizes which do not exceed ⅜″ square or flat.

Malleable iron handle, japanned black. Screw and yoke white nickelled.

Length, 5¼″.

Price ... ... **8d.** each.

Fig. 2151. FILE HANDLES, with Iron Ferrules.

Fig. 2152. BIT GAUGES No. 1.

This gauge clamps to shank of bit the same as No. 2, but is without contact ball. For this reason is recommended for common work only. Polished. Steel set screw.

Length, 4¾″.

Price each ... **10d.**

Fig. 2143. PAINT SCRAPERS.

Cocoa handle.

Size, inches ...	5×2	5×3	5×4	6×3	6×4
Price per dozen ...	**24/–**	**31/6**	**43/6**	**43/6**	**47/–**

Fig. 2144. YACHT SCRAPERS.

Through tang.

Size, inches	3×½	3½×2½	4×2½
Price per dozen ...	**19/–**	**19/6**	**21/6**

Fig. 2145. PLUMBERS' SHAVE HOOKS.

Through tang.

Size of head, inches	2½	2½	3
Price per dozen	**16/6**	**18/–**	**19/–**

Fig. 2146. GILDERS' KNIVES.

Cocoa.

6″ ... ... **25/–** per dozen.

Fig. 2147. LINO KNIVES.

	Beech handle.	Hand forged.
Size, inches	3	4
Price per dozen	**18/6**	**21/–**

Fig. 2148. SHOE KNIVES.

Heel parer, bevel point, clip point and square point.

Beech	**11/6** per dozen
Rosewood	**16/–** ,,

Fig. 2150. GOODELL No. 41 WASHER CUTTER.

Will cut washers from 1″ to 5″. Provided with adjustable blades, which can be easily removed for re-sharpening.

Price ... **8/9** each. Blades ... **1/6** set.

Assorted, ½″, ⅝″, ¾″. **21/–** per gross.

Fig. 2153. BIT GAUGES No. 2.

By the use of this tool any number of holes can be bored to a uniform depth. It clamps to shank of any size auger bit, and tightens on the bit and gauge spindle at the same time. Contact ball revolves on ball bearings, which reduces friction to a minimum and prevents defacing the most delicate material. Nickel plated. Steel set screw. Length, 5¾″.

Price ... **1/2** each.

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GAUGES, BRADAWLS.

Fig. 2154. MARKING GAUGES.

	Per dozen
Best Beechwood Marking Gauges	**10/–**
,, ,, ,, head faced with brass	**22/–**

Fig. 2155. CUTTING GAUGES.

	Per dozen
Best Beechwood Cutting gauges	**13/–**
Best Hardwood Cutting Gauges	**22/–**
,, ,, ,, brass hooped	**28/–**
Plain Rosewood New Cutting Gauge	**36/–**
Shield Plated Rosewood New Cutting Gauge	**42/–**
Shield Ebony New Cutting Gauge	**46/–**

Fig. 2156. MORTICE GAUGES.

	Per dozen
Best Slide Mortice Gauges, plain heads	**34/–**
,, ,, ,, plated heads	**40/–**
,, ,, ,, faced heads	**48/–**
Rosewood Screw Slide, Thumb or Turnscrew Stem Mortice Gauge	**56/–**
,, ,, ,, ,, ,, ,, head faced	**68/–**
Ebony Screw Slide, Thumb or Turnscrew Stem Mortice Gauge, head faced	**72/–**

Fig. 2157. SPOKESHAVES.

Size, inches	2½	3	3½	4	4½	5	5½	6
Beech, plain, per dozen	**10/9**	**12/7**	**14/5**	**16/3**	**21/7**	**27/–**	**32/6**	**37/9**
Beech, plated, per dozen	**14/5**	**16/3**	**19/–**	**22/6**	**27/–**	**31/6**	**37/10**	**43/3**
Box, plain, per dozen	**16/9**	**18/6**	**22/3**	**26/–**	**33/6**	—	—	—
Box, plated, per dozen	**22/3**	**25/–**	**27/9**	**33/6**	**42/6**	—	—	—

Fig. 2158. BEST QUALITY BEVELS.

Size, inches	7½	9	10½	12	15
Rosewood, sliding, per dozen	**28/9**	**32/6**	**36/–**	**39/9**	**50/6**
Ebony, sliding, per dozen	**33/–**	**37/–**	**41/–**	**45/–**	**57/–**

Fig. 2159. BEECH PAD SAWS.

Small	**8/6** per doz.	Medium, with springs	**11/–** per doz.
Small, with springs	**9/6** ,,	Large, with springs	**13/–** ,,

Fig. 2160. BRADAWLS, ASSORTED.

Holdfast	**29/–** per gross.	Flooring	**35/–** per gross.
Pinned	**32/6** ,,	Unpinned	**27/6** ,,

Bradawl Handles **15/–** per gross.

Fig. 2161. BEST QUALITY MITRE SQUARES.

Size, inches	8	10	12	14	16
Rosewood, best plated, per dozen	**45/–**	**52/3**	**59/6**	**69/9**	**79/3**
Ebony, best plated, per dozen	**52/–**	**60/–**	**70/–**	**80/–**	**92/–**

Fig. 2162. JOINERS' SQUARES.

Size, inches	3	4½	6	7½	9	10½	12	15	18
Rosewood, dia. plated, per dozen	**15/3**	**17/6**	**21/9**	**25/9**	**30/3**	**35/3**	**39/9**	**52/3**	**66/9**
Rosewood, shield plated, per dozen	**18/6**	**20/3**	**23/6**	**28/9**	**34/3**	**38/9**	**46/–**	**61/3**	**75/9**
Ebony, shield plated, per dozen	**22/–**	**24/–**	**28/–**	**34/–**	**40/–**	**46/–**	**54/–**	**74/–**	**90/–**

Fig. 2163. TURNING SAWS AND FRAMES.

Size, inches	10	12	14	16	18	20	22	24
Beech handled, per dozen	**48/9**	**54/–**	**57/9**	**68/9**	**79/3**	**90/–**	**101/–**	**112/–**
Box handled, per dozen	**54/–**	**59/6**	**60/–**	**76/6**	**87/9**	**101/–**	**112/–**	—

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TURNSCREWS.

Fig. 2164. BEST QUALITY ELECTRICIANS' TURNSCREWS.

Fitted with cabinet and spindle blade, and oval beech handle.

Length, inches	3	4	5	6	7	8	9	10	12		
Oval beech handle, cabinet blade, per doz.	**5/–**	**5/9**	**7/–**	**8/3**	**9/3**	**11/3**	**12/9**	**13/9**	**16/9**		
Length, inches	1	1½	2	2½	3	3½	4				
Oval beech handle, spindle blade...	**2/6**	**2/9**	**3/–**	**3/3**	**3/6**	**3/9**	**4/–**				

Fig. 2170.
No. 63 MILLERS FALLS RATCHET TURNSCREW.

Ratchet operates by means of cam in rear of shifter sleeve. Operates left, right, or can be fixed.

Length, inches ...	2	3	4	6
Price each ...	**3/–**	**3/6**	**4/–**	**4/4**

Fig. 2171.
No. 60 MILLERS FALLS TURNSCREW.

Cocobolo handles.

Length of blade, inches ...	1½	2½	3½
Price per dozen	**10/–**	**10/5**	**10/9**

Fig. 2172. OVAL HANDLE CABINET TURNSCREWS.

Length, inches	3	4	5	6	7	8	9	10	12		
Beech, per dozen	**5/–**	**5/9**	**7/–**	**8/3**	**9/9**	**12/–**	**14/3**	**16/–**	**18/–**		
Boxwood, per dozen....	**8/6**	**10/–**	**11/6**	**13/9**	**17/3**	**21/6**	—	—	—		

Fig. 2173. OVAL HANDLE CABINET TURNSCREWS.

Length, inches	3	4	5	6	7	8	9	10	12		
Beech handle, per dozen	**7/6**	**8/9**	**9/9**	**12/–**	**13/6**	**16/6**	**18/9**	**21/–**	**24/9**		
Boxwood handle, per dozen...	**10/6**	**12/6**	**14/6**	**18/3**	**21/9**	**26/3**	**32/–**	—	—		

Fig. 2174. LONDON PATTERN POLISHED BEECH HANDLE TURNSCREW.

Length, inches	3	4	5	6	7	8	9	10	12		
Price per dozen	**6/–**	**7/3**	**8/3**	**9/9**	**12/–**	**14/–**	**16/–**	**19/–**	**24/9**		

Fig. 2175. "PERFECT HANDLE" ENGINEERS' TURNSCREW.

Length, inches	2	2½	3	4	5	6	7	8	10	12	
Price per dozen....	**15/–**	**16/–**	**17/–**	**18/–**	**21/–**	**25/–**	**30/–**	**34/–**	**42/–**	**50/–**	

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TURNSCREWS.

Fig. 2176. No. 15 " Yankee " Turnscrew.

Left and right ratchet and fixed positions by simply moving slide.

Size, inches ...	2	3	4	5	6	8
Price per doz.	**35/–**	**36/8**	**38/4**	**40/–**	**41/8**	**45/–**

Fig. 2177. No. 10.

Same as No. 15, but without knurled pusher.

Size, inches	2	3	4	5	6	8	10	12
Price per doz.	**31/8**	**39/2**	**41/8**	**45/10**	**51/8**	**58/4**	**70/–**	**77/–**

Fig. 2178. Reversible Spiral Ratchet Turnscrew No. 30.

Same ratchet mechanism as No. 15.

				Per doz.
No. 30.	Closed $13\frac{1}{2}''$.	Extended $19\frac{1}{4}''$.	... Price	**145/10**
No. 31.	,, $17\frac{1}{2}''$.	,, $26\frac{1}{4}''$.	... ,,	**195/10**
No. 35.	,, $9\frac{1}{4}''$.	,, $12\frac{1}{2}''$.	... ,,	**108/4**

Fig. 2179. No. 20.

Modification of No. 30 with ratchet screws into position but will not remove them that way.

				Per doz.
Size 1.	Length extended with bit,	$14''$	... Price	**93/4**
Size 2.	,, ,, ,,	$17''$	... ,,	**108/4**
Size 3.	,, ,, ,,	$19''$	... ,,	**125/–**

Fig. 2180. Reversible Spiral Ratchet Turnscrew.
Nos. 130, 131 and 135.

Same as No. 3 but with spring in handle causing the handle to return for the next push in driving screws in or out.

				Per doz.
No. 130.	Length closed with bit,	$13\frac{1}{2}''$.	Extended $19\frac{1}{4}''$.	**166/8**
No. 131.	,, ,, ,,	$17\frac{1}{2}''$.	, $26\frac{1}{4}''$.	**225/–**
No. 135.	,, ,, ,,	$9\frac{1}{4}''$.	,, $12\frac{1}{2}''$.	**129/2**

Fig. 2181. Bit with Screw Holder
for

Nos. 30, 130 and No. 20 size 2	Price	**25/10** doz.
Nos. 31, 131 and No. 20 size 3.	,,	**25/10** ,,
Nos. 35, 135 and No. 20 size 1.	,,	**22/11** ,,

Fig. 2182.
No. 12 Ratchet Turnscrew.

Same mechanism as No. 15, but blade is only $1\frac{1}{8}''$ long. The ratchet shifter is left to right instead of up and down. Length, $5\frac{3}{4}''$; length of blade, $1\frac{1}{8}'' \times {}^{5}/_{16}''$

Price, **45/5** doz.

Drill Points.
5/3 per doz.

Fig. 2183. Bit with Screw Eye Holder
for

Nos. 30, 130 and No. 20 size 2	Price	**25/10** doz.
Nos. 35, 135 and No. 20 size 1	,,	**22/11** ,,

Showing chuck fitted with drill point.

Countersink.

Attachments for " Yankee " Turnscrews.
Chuck with drill points.

For Nos. 30, 130, 31, 131, and Nos. 20, sizes 2 and 3—Eight drill points, ${}^{1}/_{16}''$ to ${}^{11}/_{64}''$, with chuck. Price **45/10** doz.

For Nos. 35, 130, and No. 20 size 1.—Three drill points, ${}^{1}/_{16}''$ to ${}^{3}/_{32}''$, with chuck. Price **22/11** doz.

Countersinks.

For Nos. 20, sizes 1, 2 and 3, Nos. 30, 130, 31, 131, 35 and 135.
11/8 per doz.

Fig. 2184. No. 90 " Yankee " Plain Turnscrew.

With heavier blade than No. 95. Blade cannot come loose.

Size, inches ...	$1\frac{1}{2}$	2	3	4	5
Price per doz. ...	**15/–**	**15/–**	**16/8**	**19/7**	**24/2**
Size, inches ...	6	8	10	12	
Price per dozen	**27/6**	**36/8**	**45/–**	**52/6**	

Fig. 2185. No. 95 " Yankee " Plain Turnscrew.
with straight blade.

Strong and serviceable for electricians. Blade cannot come loose.

Size, inches ...	$2\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$10\frac{1}{2}$	$12\frac{1}{2}$
Price per doz.	**15/–**	**16/8**	**19/2**	**21/8**	**24/2**	**29/7**	**35/5**	**40/5**

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TURNSCREWS.

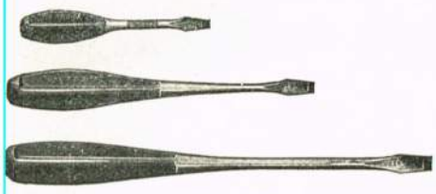

Fig. 2190.

BILLINGS' MODEL P.

Handle and blade all drop-forged steel. Turnscrews, blades tempered, round shank.

No.	Length over-all inches	Length of blade inches	Width of blade inches	Weight ozs.	Price each
12	5	$2\frac{3}{4}$	$\frac{1}{4}$	$2\frac{1}{2}$	**1/3**
13	8	4	$\frac{1}{4}$	5	**2/–**
14	9	5	$\frac{1}{4}$	$5\frac{1}{2}$	**2/3**
15	10	6	$\frac{1}{4}$	6	**2/6**
16	$11\frac{1}{2}$	7	$^5/_{16}$	8	**3/–**
17	$12\frac{1}{2}$	8	$^5/_{16}$	$8\frac{3}{4}$	**3/6**
18	14	$8\frac{1}{2}$	$\frac{3}{8}$	$13\frac{1}{4}$	**3/9**
19	16	$10\frac{1}{2}$	$\frac{3}{8}$	$14\frac{1}{4}$	**4/6**
20	18	$12\frac{1}{2}$	$\frac{3}{8}$	15	**5/–**

Fig. 2191.

BILLINGS' ALL-STEEL MACHINISTS' TURNSCREWS.

With square shank.

No.	Length over-all inches	Length of blade inches	Width of blade inches	Size of shank inches	Weight	Price each
21	$9\frac{1}{2}$	5	$\frac{5}{8}$	$^7/_{16}$	$9\frac{1}{2}$ ozs.	**3/6**
22	$10\frac{1}{2}$	5	$\frac{3}{4}$	$^9/_{16}$	1 lb.	**4/6**

Fig. 2192.

No. 556 STARRETT EYE-GLASS TURNSCREWS

Made in two pieces and screwed together, telescoping the blade when not in use. It is neat and safe to carry in the pocket, on keying or attached to a watch chain. Nickel plated.

The engraving shows the actual size of the screw driver.

Price ... **1/–** each.

Fig. 2193.

STARRETT'S No. 557 PATENT MAGAZINE TURNSCREW.

With four blades of different widths, folding into telescopic handle. Held by spring pressure to prevent rattling.

Price **6/3** each. Extra blades, **9d.** each.

Fig. 2194.

STARRETT No. 553 POCKET TURNSCREW.

Made of steel, nickel-plated. Blade shank held firmly in position. Blade can be reversed into handle and securely held by chuck.

No.	Diam.	Blade length	Weight	Price each
553A	$\frac{1}{4}''$	$1\frac{7}{8}''$	$\frac{1}{2}$ oz.	**1/9**
553B	$\frac{3}{8}''$	$3''$	$1\frac{1}{2}$ oz.	**2/3**

Extra blades, **9d.** each.

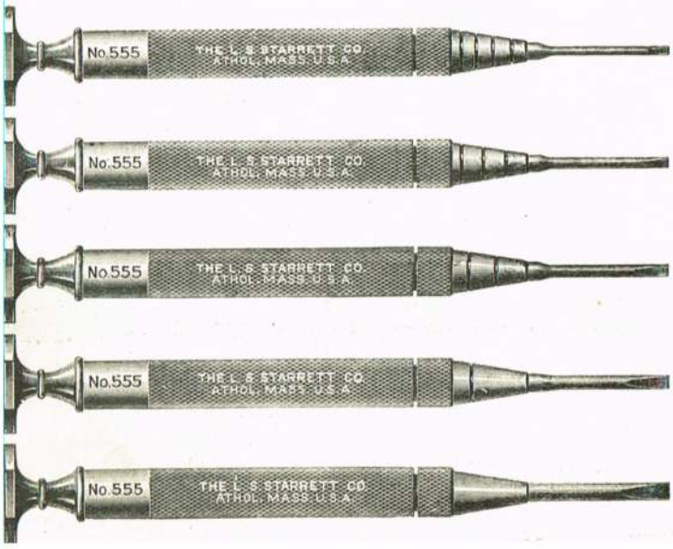

Fig. 2195.

STARRETT NICKEL-PLATED JEWELLERS' TURNSCREWS, No. 555.

No.	Handle diam. inches	Blade inches	Price each
555A	$\frac{1}{4}$	.040	**2/–**
555B	$\frac{1}{4}$	.058	**2/–**
555C	$\frac{1}{4}$	.070	**2/–**
555D	$\frac{1}{4}$	.080	**2/–**
555E	$\frac{1}{4}$	.100	**2/–**

Set of 5 ... Price **9/6.**

Extra blades, **9d.** each.

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CHISELS AND GOUGES.

Fig. 2196. HANDLED GOUGES.

	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2	inches
C.S. Firmer Gouges, Round, Beech or Ash Handles, Brass Ferrules	7/9	8/–	8/3	8/9	9/–	9/6	10/3	11/3	11/9	14/3	15/9	17/–	19/–	23/–	27/6	per doz.
C.S. Firmer Gouges, Best London Octagon Beech Handles, Brass Ferrules	9/3	9/6	9/9	10/3	10/6	11/6	12/3	13/3	13/9	16/6	18/–	19/6	21/6	25/6	30/-	,,
C.S. Firmer Gouges Best London Octagon Boxwood Handles, Brass Ferrules	11/3	11/6	11/9	12/3	12/6	13/6	14/3	15/3	15/9	18/6	20/–	22/–	24/–	27/–	32/–	,,
C.S. Long Paring Gouges, Round Beech or Ash Handles, Brass Ferrules	15/–	15/3	15/3	16/–	16/–	17/–	18/3	19/–	21/6	24/9	27/9	29/6	32/–	38/6	45/–	,,
C.S. Long Paring Gouges, Best London Octagon Beech Handles, Brass Ferrules ...	16/6	16/9	16/9	17/6	17/6	19/–	20/3	21/–	23/6	27/–	30/–	32/–	34/6	41/–	47/6	,,
C.S. Long Paring Gouges, Best London Octagon Boxwood Handles, Brass Ferrules ...	18/6	18/9	18/9	19/6	19/6	21/–	22/3	23/–	25/6	29/–	32/–	34/6	37/–	43/–	49/9	,,
C.S. Registered Gouges, with two Bright Iron Ferrules	13/–	13/–	13/3	13/6	13/6	14/3	15/9	17/–	20/–	21/3	22/9	24/–	25/9	...	...	,,

Fig. 2197. CHISEL HANDLES.

	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1	inches
Brass Ferrules. Bott. Neck or Round Pattern...	17/9	19/3	20/3	23/6	24/–	26/6	29/3	33/–	34/–	per gross

Fig. 2198. HANDLED CHISELS.

	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 3/4	2	inches
C.S. Registered Chisels, Handles, with two Bright Iron Ferrules...	12/–	12/3	12/3	12/6	12/6	13/3	14/6	15/9	18/9	19/9	20/9	22/–	23/3	27/3	30/3	per doz.
C.S. Firmer Chisels, Round Beech or Ash Handles, Brass Ferrules	6/9	7/–	7/3	7/9	8/–	8/6	9/–	10/–	10/6	12/9	13/9	15/–	16/6	20/–	23/6	,,
C.S. Firmer Chisels, Round Improved Pattern Beech Handles, Brass Ferrules	6/9	7/–	7/3	7/9	8/–	8/6	9/–	10/–	10/6	12/9	13/9	15/–	16/6	20/–	23/6	,,
C.S. Firmer Chisels, Round Boxwood Handles, Brass Ferrules	9/6	9/9	10/–	10/6	10/9	11/6	12/–	13/–	13/6	16/–	17/–	18/6	20/–	24/–	27/6	,,
C.S. Firmer Chisels, Best London Octagon Beech Handles, Brass Ferrules	8/3	8/6	8/9	9/3	9/6	10/6	11/–	12/–	12/6	15/–	16/–	17/6	19/–	22/6	26/–	,,
C.S. Firmer Chisels, Best London Octagon Boxwood Handles Brass Ferrules	10/3	10/6	10/9	11/3	11/6	12/6	13/–	14/–	14/6	17/–	18/–	20/–	21/6	24/6	28/–	,,
C.S. Firmer Chisels, Bevelled Edges, Round Beech or Ash Handles, Brass Ferrules ...	10/9	11/–	11/3	11/9	12/–	12/6	13/–	14/–	14/6	18/9	19/9	21/–	22/6	28/–	31/6	,,
C.S. Firmer Chisels, Bevelled Edges, Improved Beech or Ash Handles, Brass Ferrules ...	10/9	11/–	11/3	11/9	12/–	12/6	13/–	14/–	14/6	18/9	19/9	21/–	22/6	28/–	31/6	,,
C.S. Firmer Chisels, Bevelled Edges, Best London Octagon Beech Handles, Brass Ferrules	12/3	12/6	12/9	13/3	13/6	14/6	15/–	16/–	16/6	21/–	22/–	23/6	25/–	30/6	34/–	,,
C.S. Firmer Chisels, Bevelled Edges, Best London Octagon Boxwood Handles, Brass Ferrules	14/3	14/6	14/9	15/3	15/6	16/6	17/–	18/–	18/6	23/–	24/–	26/–	27/6	32/6	36/–	,,
C.S. Long Paring Chisels, Round Beech or Ash Handles, Brass Ferrules	10/–	10/3	10/3	11/–	11/–	12/–	13/3	14/–	16/6	18/9	21/9	23/6	26/–	30/6	37/–	,,
C.S. Long Paring Chisels, Best London Octagon Beech Handles, Brass Ferrules ...	11/6	11/9	11/9	12/6	12/6	14/–	15/3	16/–	18/6	21/–	24/–	26/–	28/6	33/–	39/6	,,
C.S. Long Paring Chisels, Best London Octagon Boxwood Handles, Brass Ferrules ...	13/6	13/9	13/9	14/6	14/6	16/–	17/3	18/–	20/6	23/–	26/–	28/6	31/–	35/–	41/6	,,
C.S. Bevelled Edge Chisels, Round Beech or Ash Handles, Brass Ferrules	16/–	16/3	16/3	17/–	17/–	18/–	19/3	20/–	22/6	27/9	30/9	32/6	35/–	42/6	49/–	,,
C.S. Bevelled Edge Chisels, Best London Octagon Beech Handles, Brass Ferrules ...	17/6	17/9	17/9	18/6	18/6	20/–	21/3	22/–	24/6	30/–	33/–	35/6	37/6	45/–	51/6	,,
C.S. Bevelled Edge Chisels, Best London Octagon Boxwood Handles, Brass Ferrules.	19/6	19/9	19/9	20/6	20/6	22/–	23/3	24/–	26/6	32/–	35/–	37/6	40/–	47/–	53/6	,,

Fig. 2199. HANDLED SOCKET AND MORTICE CHISELS.

	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	inches
C.S. Socket Firmer Chisels, Beech Handles	15/9	16/6	16/9	19/–	19/–	20/3	21/–	22/3	22/9	24/–	25/6	26/6	27/6	29/3	31/–	32/9	34/–	per doz.
C.S. Socket Firmer Chisels, Beech Handles, Polished	20/9	21/9	21/9	24/–	24/–	25/3	26/–	27/3	27/9	29/–	30/6	31/6	32/6	34/3	36/–	37/9	39/–	,,
C.S. Socket Chisels, Blued, Strong Ferruled Handles	18/9	18/9	18/9	18/9	18/9	19/6	20/6	21/6	23/–	24/9	26/6	27/9	29/3	31/–	33/6	35/6	37/6	,,
C.S. Socket Chisels, Bright, Srong, Ferruled Handles	20/9	20/9	20/9	20/9	20/9	21/6	22/6	23/6	25/–	26/9	28/6	29/9	31/3	34/–	36/6	38/6	40/6	,,
C.S. Mortice Chisels, Handles ...	22/9	22/9	23/6	24/9	26/6	30/–	35/–	45/–	53/6	...	...	...	...	...	...	...	...	,,
C.S. London Sash Chisels, Beech Handles	21/–	21/–	21/9	23/–	24/9	28/3	...	...	...	...	...	...	...	...	...	...	...	,,
C.S. London Sash Chisels, Boxwood Handles	24/–	24/–	24/9	26/–	27/9	31/3	...	...	...	...	...	...	...	...	...	...	...	,,
C.S. London Sash Chisels, Boxwood Handles, New Pattern Bolsters	25/–	25/–	25/9	27/–	28/9	32/3	...	...	...	...	...	...	...	...	...	...	...	,,

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SPRING BALANCES.

Fig. 3100. IMPROVED SPRING BALANCE, No. 2.

To weigh lbs.	¼×12	¼×15	¼×20	¼×25	¼×30	½×25	½×30
Price, dozen, with hook only	**25**/–	**46**/–	**65**/–	**85**/–	**108**/–	**26**/–	**46**/–
Price, dozen, with round tin Scale, inches	**48**/– 8	**74**/– 9	**93**/– 9	**120**/– 10	**143**/– 10	**49**/– 8	**74**/– 9

To weigh lbs.	½×40	½×50	½×60	1×50	1×60	1×75	1×100
Price, dozen, with hook only	**85**/–	**120**/–	**165**/–	**60**/–	**96**/–	**108**/–	**165**/–
Price, dozen, with round tin Scale, inches	**120**/– 10	**165**/– 11	**210**/– 11	**105**/– 11	**141**/– 11	**153**/– 11	**220**/– 12

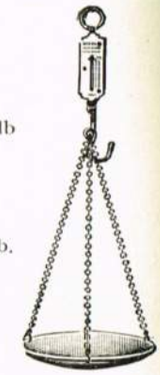

Fig. 3101. PATENT BALANCE. Strong and Sensitive. No. 1A.

Made with extra long springs working in an inner tube, giving additional sensitiveness.

To weigh ...	¼oz.×2lb.	½oz.×4lb.	1ox.×6lb.	1oz.×8lb.	1oz.×10lb.	1oz.×12lb.	2cz.×8lb.	2oz.×10lb
Price each, with hook only	**8/6**	**8/6**	**8**/–	**8/6**	**9/6**	**14**/–	**8**/–	**8**/–
Price each, with round tin Scale, inches	**10/6** 8	**10/6** 8	**10**/– 8	**10/6** 8	**11/10** 9	**17**/– 10	**10**/– 8	**10**/– 8

To Weigh ...	2oz.×14lb.	2oz.×20lb.	2oz.×24lb.	¼lb.×50lb.	¼lb.×60lb.	½lb.×80lb.	½lb.×100lb.	½lb.×112lb.
Price each, with hook only	**8/6**	**9/6**	**14**/–	**18**/–	**23/6**	**26**/–	**30**/–	**36**/–
Price each, with round tin Scale, inches	**10/10** 9	**12/6** 10	**17**/– 10	**21/9** 11	**27/3** 11	**29/9** 11	**34/9** 12	**45**/– 14

Fig. 3102. POCKET SPRING BALANCE. No. 3.

To weigh lbs.	12×¼	15×¼	20×¼	25×¼	25×½	30×½	40×½	50×½	60×½	40×1	50×1	60×1	75×1	100×1
Price per dozen ...	**15**/–	**27**/–	**43**/–	**60**/–	**15**/–	**27**/–	**43**/–	**60**/–	**90**/–	**27**/–	**32**/–	**45**/–	**54**/–	**91**/–
Price, doz., with round tin Scale, inches	**33**/– 7	**50**/– 8	**71**/– 9	**95**/– 10	**33**/– 7	**50**/– 8	**71**/– 9	**105**/– 11	**135**/– 11	**55**/– 9	**67**/– 10	**80**/– 10	**99**/– 11	**146**/– 12

Fig. 3103. IMPROVED CIRCULAR BALANCE. No. 85.

To weigh, lbs....	112×½	200×½	224×½	250×½	300×½	200×1	224×1	250×1
Brass Dial, diam., inches ...	8½	14	14	16	18	8½	8½	10
Price each, with hook only ...	**46**/–	**70**/–	**75**/–	**92**/–	**120**/–	**42**/–	**46**/–	**53**/–

To weigh, lbs.	300×1	350×1	400×1	500×1	600×1	800×1	800×2	1000×2
Brass dial, diam., ins.... ...	12	12	14	16	18	24	15	18
Price each, eith hook only ...	**60**/–	**66**/–	**80**/–	**100**/–	**120**/–	**160**/–	**100**/–	**110**/–

To weigh	10c.×2lbs.	15c.×4lbs.	20c.×7lbs.	25c.×7lbs.	30c.×7lbs.	40c.×7lbs.	60c.×14lbs
Brass dial diam., ins. ...	18	18	18	20	20	20	20
Price each, with hook only ...	**114**/–	**120**/–	**150**/–	**180**/–	**190**/–	**220**/–	**230**/–

EXTRAS—	To carry 3 cwts.		To carry from 3 to 6 cwts.
If with iron arm and wood platform, as illustrated	**44**/– each	...	**53**/– each
If with double iron arm and iron platform scale for casks, boxes, trusses of hay ...	**72**/– each	...	**92**/– each
If with iron arm with four hooks, suspended from beam, to hold iron bars, etc.	**35**/– each	...	**42**/– each

White enamel dials and black figures	8½″ diam.	**2**/–each extra on above prices.	
" " "	10″—12″ diam.	**3**/–	" "
" " "	13″—14″ diam.	**3/6**	" "
" " "	15″—16″ diam.	**4**/–	" "
" " "	18″ diam.	**5**/–	" "

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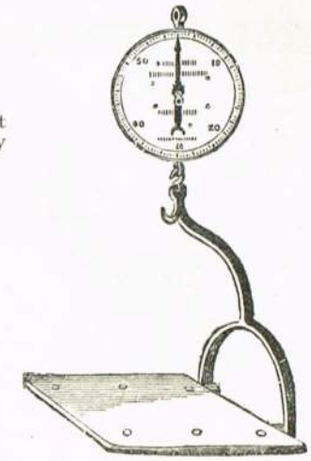
SPRING BALANCES.

Fig. 3104. CIRCULAR BALANCE. No. 95.

Specially suitable for warehouses, parcels offices, etc.



To weigh—			Price each.	Price each, if without Scale and with Hook only adjusted for Scale.
28 lb.×2 oz.	10 in. Brass Dial,	14 in. Square Iron Scale	**70**/–	... **53**/–
56 lb.×2 oz.	15 ,, ,,	16 ,, ,, ,, ...	**103**/–	... **78**/–
56 lb.×¼ lb.	10 ,, ,,	16 ,, ,, ,, ...	**78**/–	... **53**/–
80 lb.×¼ lb.	12 ,, ,,	16 ,, ,, ,, ...	**92**/–	... **67**/–
112 lb.×¼ lb.	15 ,, ,,	18 ,, ,, ,, ...	**107**/–	... **78**/–
112 lb.×½ lb.	10 ,, ,,	18 ,, ,, ,, ...	**84**/–	... **55**/–
150 lb.×½ lb.	12 ,, ,,	20 ,, ,, ,, ...	**104**/–	... **64**/–
200 lb.×½ lb.	15 ,, ,,	20 ,, ,, ,, ...	**122**/–	... **78**/–

Fig. 3104A. PATENT CIRCULAR BALANCES. No. 20.

To weigh, lbs.	¼×50	¼×56	¼×100	½×100	½×112	½×150	½×200	½×250	½×300	1×100
Diam. of Dial, inches	5	6	10	5	6	8	10	13	15	5
Price each, with hook only ...	**16**/–	**19**/–	**50**/–	**16/6**	**19/6**	**32**/–	**50**/–	**70**/–	**90**/–	**16**/–
Price each, with round tin Scale, inches ...	**19/9** 11	**23/9** 12	**59**/– 14	**25/6** 14	**31/6** 16	**54**/– 18	**72**/– 18	**107**/– 24	**127**/– 24	**30**/– 14
To weigh, lbs.	1×150	1×200	1×224	1×250	1×300	1×336	1×400	1×500	1×600	
Diam. of Dial, inches	5	5	6	8	8	9	10	13	15	
Price each, with hook only ...	**16/6**	**16/6**	**19/6**	**28**/–	**32**/–	**40**/–	**50**/–	**70**/–	**90**/–	
Price each, with round tin Scales, inches ...	**38/6** 18	**38/6** 18	**44/6** 20	**58**/– 22	**69**/– 24	**77**/– 24	**95**/– 24	**115**/– 24	**135**/– 24	

NOTE.—Weights 150 lbs.×½ lb. to 600 lb.×1 lb. are heavy pattern with strong iron supports underneath scales, excepting 100 lb.×1 lb. size If made with white enamelled dials, with black figures, extra charges as follows :—5″ and 6″, **1**/– each ; 8″ and 9″, **2**/– each ; 10″, **2/6** each ; 13″, **3**/– each ; 15″, **4**/– each.

Fig. 3105. FAMILY BALANCE for Domestic Use. No. 48. These balances are fitted with adjusting screw to enable the user to allow for tare weight of any vessel used for holding the goods to be weighed. Finished in black and gold.

		Round Tin Scale. 8½″	Oblong Tin Scale. 10″×7″
To weigh 20 lb.×1 oz.	5″ White En. Dial ...	**10/6**	... **11/9**
To weigh 28 lb.×2 oz.	5″ White En. Dial ...	**11**/–	... **12/3**

If fitted with 8½″ Round Enamelled Scale, **2**/– extra.

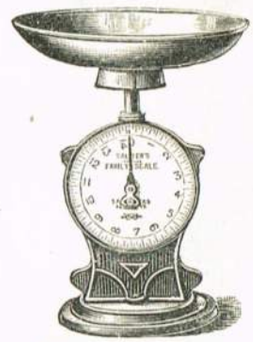


Fig. 3106. No. 50.

Fig. 3106. IMPROVED FAMILY BALANCE. No. 50.

These machines are now made on an improved principle, and will show correct weight in whatever position goods may be placed. The Scales will be found of great utility in private use, and no housekeeper should be without one. Besides being useful for weighing groceries, fruits, ingredients for puddings, etc., etc., they will be found invaluable for showing at a glance that goods purchased are correct weight.

With brass or enamelled dials.

To weigh	½ oz.×7 lb.	1 oz.×14 lb.	1 oz.×25 lb.	2 oz.×28 lb.	2 oz.×50 lb.
Dial, inches	5	5	7¾	6½	7¾
Price each with round tin Scale, inches	**12/6** 9	**13**/– 9	**24**/– 11	**15**/– 10	**25/6** 12
Price each, with oblong tin Scale, inches	**13/9** 10×7	**14/3** 10×7	**25/6** 12×9	**16/3** 11×8	**27**/– 13×9½

If fitted with Enamelled Iron Scales, **3/6** each extra.

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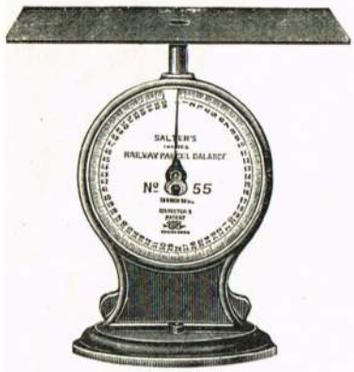

Fig. 3107. Railway Parcel Balance, No. 55. These balances will be found of the greatest utility in warehouses, etc. To weigh 56lb.×2oz., fitted with 7¾″ Enamelled Dial and a 14″×9″ Japanned Iron Scale. Price, **33**/– each.

Fig. 3108.

Parcels Post Balances, No. 25, are fitted with Brass or Enamelled Dials and Flat Brass Scale, with current postal rates marked on the dials. Balance with 4″ dial is 8¼″ high; with 5″ dial is 10″ high; with 6½″ dial is 10″ high.

To weigh	11 lb.×1 oz.	4″ brass dial	6″×4″ brass scale	**13/6** each
,,	11 lb.×1 oz.	5″ ,,	7″×5″ ,,	**15**/– ,,
,,	11 lb.×½ oz.	6½″ ,,	9″×7″ ,,	**18**/– ,,
,,	11 lb.×1 oz.	4″ End. dial	6″×4″ ,,	**14**/– ,,
,,	11 lb.×1 oz.	5″ ,,	7″×5″ ,,	**15/6** ,,
,,	11 lb.×½ oz.	6½″ ,,	9″×7″ ,,	**18/6** ,,

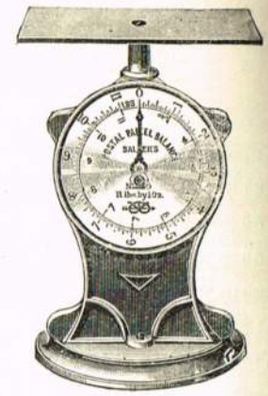

Fig. 3109. TRADE CIRCULAR BALANCE, No. 20T. To meet the requirements of the Weights and Measures Regulations, 1907.

To Weigh.	Diameter of Brass Dial.	With Hook only.	With Round Tinned Scale and Chains.	
*100 lb. by ½ lb. ...	9 inch	**41**/– each	14 in. Scale,	**50**/– each.
112 lb. by ½ lb. ...	10 ,,	**50**/– ,,	16 ,,	**62**/– ,,
120 lb. by ½ lb. ...	13 ,,	**70**/– ,,	16 ,,	**82**/– ,,
150 lb. by ½ in. ...	15 ,,	**76**/– ,,	18 ,,	**98**/–
*200 lb. by 1 lb. ...	9 ,,	**42**/– ,,	18 ,,	**64**/–
224 lb. by 1 in. ...	10 ,,	**50**/– ,,	20 ,,	**75**/–
250 lb. by 1 in. ...	13 ,,	**70**/– ,,	22 ,,	**100**/–
300 lb. by 1 in. ...	15 ,,	**77**/– ,,	24 ,,	**114**/–
400 lb. by 2 lb. ...	10 ,,	**58**/– ,,	24 ,,	**98**/– ,,
450 lb. by 2 lb. ...	10 ,,	**60**/– ,,	24 ,,	**105**/–
500 lb. by 2 lb. ...	13 ,,	**74**/– ,,	24 ,,	**119**/– ,,
560 lb. by 2 lb. ...	15 ,,	**90**/– ,,	24 ,,	**135**/– ,,
600 lb. by 2 lb. ...	15 ,,	**98**/– ,,	24 ,,	**148**/– ,,
800 lb. by 4 lb. ...	15 ,,	**108**/– ,,	24 ,,	**163**/– ,,

These heavy weights have strong iron supports underneath.

If made with White Enamelled Dials and Black Figures, extra price is—9 in., **2**/–; 10 in., **3**/–; 13 in., **3/6**; 15 in., **4**/– each.

* These two sizes can be supplied with White Dials and Plate Glass Cover, with Nickel-plated Rim, at **28**/– each extra. Prices include plugging ready for stamping.

Fig. 3110. TRADE CIRCULAR BALANCE, No. 60T.

		With Hook only.	With Hook and Round Tin Scale.		
To weigh	10 lb.×¼ oz.	**38**/–	10 in. Scale ...	**41**/–	Including Bracket.
,,	20 lb.×1 oz.	**38**/–	11 ,, ...	**42**/–	,, ,,
,,	30 lb.×1 oz.	**65**/–	11 ,, ...	**69**/–	,, ,,
,,	40 lb.×2 oz.	**62/6**	11 ,, ...	**66/6**	Not including Bracket.
,,	60 lb.×2 oz.	**65**/–	11 ,, ...	**69**/–	,, ,,
,,	120 lb.×¼ lb.	**70**/–	14 ,, ...	**84**/–	,, ,,
,,	150 lb.×½ lb.	**72**/–	16 ,, ...	**89**/–	,, ,,

If fitted with Galvanized Arm, **3**/– extra. If fitted wuth Chains and 15in. D Scoop Tin Scales, **19**/– extra. If fitted with Chains and 19in. D Scoop Tin Scales, **24**/– extra. Prices include plugging ready for stamping.

		Extra to Price of Hook. Up to 40lbs.	Above 40lbs.
If fitted with Japanned Iron Arms and	16 in. B, Oblong tin scales	**20**/– ...	**24**/–
,, ,, ,,	18 in. B, ,, ,, ...	**22/6** ...	**27**/–
,, ,, ,,	20 in. B, ,, ,, ...	**30**/– ...	**37**/–
,, ,, ,,	12 in. C, square tin scales	**15**/– ...	**20**/–
,, ,, ,,	14 in. C, ,, ,, ...	**17**/– ...	**23**/–
,, ,, ,,	20×14 in. E, semi-cir. tin scales	**30**/– ...	**35**/–
,, ,, ,,	24×16 in. E, ,, ,, ...	**40**/– ...	**46**/–
If fitted with Japanned Iron Arms and	16 in. B, enamelled iron oblong scales ...	**29**/– ...	**33**/–
,, ,, ,,	18 in. B, ,, ,, ,, ...	**34/6** ...	**39**/–
,, ,, ,,	20 in. B, ,, ,, ,, ...	**45**/– ...	**52**/–

Prices include plugging ready for stamping.

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SPRING BALANCES.

Fig. 3111.

Trade Circular Balance, No. 77T. This is a well finished Balance suitable for trade purposes, and will be found very useful and convenient for Butchers, Bakers, Fishmongers, etc. The dial is white with clear plain black figures, and is fitted with a glass cover to prevent the pointer being bent or damaged, as well as the dial becoming discoloured. All Scales are removeable.

To weigh	20 lb. × 1 oz. with 1 revolution of pointer,	10in. dial.	Hook only and bracket complete		**97/6**	each
,,	30 lb. × 1 oz. with 1½ ,, ,,	10in.	,, ,, ,, ,,	...	**105/–**	,,
,,	40 lb. × 2 oz. with 2 ,, ,,	10in.	,, No bracket required	...	**110/–**	,,
,,	60 lb. × 2 oz. with 3 ,, ,,	10in.	,, ,, ,,	...	**115/–**	,,

Extra to price of hook.

If fitted with japanned iron arm and 16in. oblong Tin Scale of	40 lb. capacity	... ...	**20/–**	each
,, ,, ,, ,, ,, ,,	60 ,,	... ...	**24/–**	,,
,, ,, galvanised ,, ,, Enamelled Scale of	40 ,,	... ...	**32/–**	,,
,, ,, ,, ,, ,, ,,	60 ,,	... ...	**36/–**	,,
,, ,, nickel-plated or polished brass arm and	15in. round enamelled pan	... ...	**45/–**	,,
,, ,, ,, ,, ,,	13in. ,, ,, scale	... ...	**45/–**	,,

Arms fitted to round scales are made to fold up for packing purposes. Above prices include plugging ready for Stamping.

Fig. 3112.

Trade Circular Balance, No. 80T.

To meet the regulations of 1907 Weights and Measures Act.

Size. To weigh—

A 4 lb. × ¼ oz. with 6½in. brass dial.
B 5 lb. × ¼ oz. ,, 8in. ,,
C 10 lb. × ½ oz. ,, 8in. ,,
D 20 lb. × 1 oz. ,, 8in. ,,

PRICES.

	With hook only each	Scale	With hook and scale each
A	**19/6**	8in.	**21/6**
B	**24/6**	8in.	**26/6**
C	**28/–**	9in.	**30/6**
D	**31/–**	10in.	**34/–**

Fig. 3113. Trade Circular Balance, No. 85T.

To weigh, lbs. ...	100×½	112×½	120×½	150×½	200×1
Brass dial, ins. ...	10	12	12	14	10
Price with hook only, each ...	**57/–**	**70/–**	**74/–**	**86/–**	**57/–**
To weigh, libs. ...	224×1	250×1	300×1	400×2	450×2
Brass dial, ins. ...	12	12	14	12	16
Price with hook only, each ...	**72/–**	**76/–**	**90/–**	**76/–**	**96/–**
To weigh, lbs. ...	500×2	560×2	600×2	800×4	1000×4
Brass dial, ins. ...	16	16	18	16	18
Price with hook only, each ...	**100/–**	**110/–**	**156/–**	**124/–**	**156/–**

To weigh, lbs.	8 cwt.×4	10 cwt.×4
Brass dial, ins.	16	18
Price with hook only, each ...	**135/–**	**156/–**

Prices include plugging ready for stamping.

Extras for Fig. 3113. Balance No. 85T.

If with iron arm and wood bottom scale. To carry 3 cwt., **44/–**. To carry 3 to 6 cwt., **53/–** each extra.
If with double iron arm and iron bottom scale. To carry 3 cwt., **72/–**. To carry 3 to 6 cwt., **92/–** each extra.
If with iron arm with iron hook (or weighing bar). To carry 3 cwt., **35/–**. To carry 3 to 6 cwt., **42/–** each extra.

Fig. 3114.

Trade Counter Platform Machine, No. 110T. Specially adapted for warehouse and parcels offices. Prices include plugging ready for stamping. Height, 3ft. 3in. Width, 15in. Depth, 18in. With Bronzed Pillar and Brass Dial, and with 18in.×15in. Iron Platform.

To weigh	100 lb. × ½ lb.	Platform 14in.×10in. in this size, 9in. brass dial (No. 111T)					... ...	Price	**170/–** each
,, ,,	100 lb. × ½ lb.	15-inch dial ...	...	Price	**270/–** each	With relieving gear	...	,,	**330/–** ,,
,, ,,	112 lb. × ½ lb.	,, ,, ...	...	,,	**275/–** ,,	,, ,,	...	,,	**335/–** ,,
,, ,,	200 lb. × 1 lb.	,, ,, ...	...	,,	**275/–** ,,	,, ,,	...	,,	**335/–** ,,
,, ,,	224 lb. × 1 lb.	,, ,, ...	...	,,	**280/–** ,,	,, ,,	....	,,	**340/–** ,,

Relieving gear is approved by Board of Trade. If fitted with wheels, **16/–** extra. Back Rail, **18/–** extra.

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WEIGHING MACHINES AND BALANCES.

Fig. 3116. JUVENILE PLATFORM WEIGHING MACHINE, No. 109.

This machine has been specially constructed to meet the increasing demand for a combined platform weighing machine and measuring rod for schools, institutions, etc. It gives correct weight at a glance, and is made to pass the Board of Trade Regulations (1907). It is small and compact, finished in black japan and gold bronze.

To weigh 120 lbs. and 55 kilogrammes × 100 grammes, with 12 inch brass or white enamelled dial	**120/–** each
To weigh 120 lbs. × ½ lb., with 8 inch brass or white enamelled dial	**110/–** ,,
To weigh 10 stone × ½ lb., with 8 inch brass or white enamelled dial	**110/–** ,,
EXTRA.—If fitted with Measuring Rod, indicating from 2 feet 9 inches to 5 feet 6 inches on one side, and centimetres on the other side	**22/–** ,,

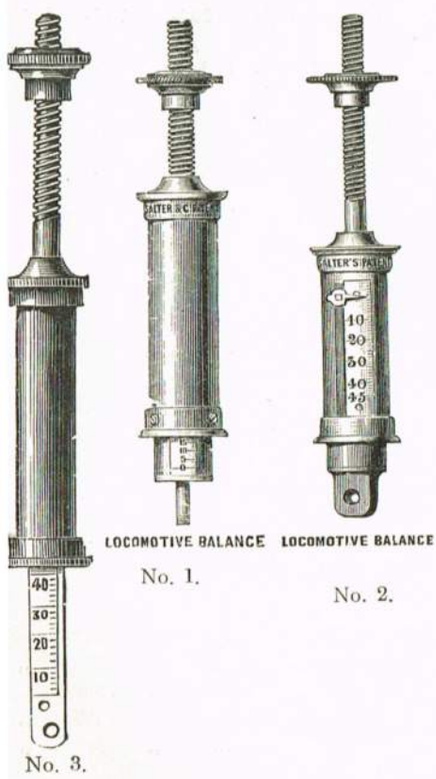

Fig. 3117. SPRING LOCOMOTIVE BALANCES.

No. 1 and 7 marked on Inner Tube.
No. 2 and 6 marked on Outer Tube.
No. 3 and 5 marked on flat side.

Prices and particulars of Nos. 1, 2 and 3, small size—

No. 1 and 2, with Screw and Nut.

Size, ins.	2½	3	3½	4	
80 lbs.	**23/–**	**24/–**	**26/–**	**27/–**	each
100 lbs.	**25/–**	**26/–**	**28/–**	**29/–**	,,
120 lbs.	**27/–**	**28/–**	**30/–**	**31/–**	,,
150 lbs.	**29/–**	**30/–**	**32/–**	**33/–**	,,
200 lbs.	**33/–**	**34/–**	**36/–**	**37/–**	,,

No. 3, with Screw and Nut.

Size, ins.	2	2½	3	3½	
60 lbs.	**18/–**	**19/–**	**20/–**	**21/–**	each
80 lbs.	—	**20/–**	**21/–**	**22/–**	,,
100 lbs.	—	**21/–**	**22/–**	**23/–**	,,
120 lbs.	—	**24/–**	**24/–**	**26/–**	,,
150 lbs.	—	**27/–**	**28/–**	**30/–**	,,

Prices and particulars of Nos. 5, 6 and 7, large size, with Screw and Nut.

Size, lbs.	80	90	100	120	130	140	150	160	170	180	190	200
Range 5″	**38/–**	**39/–**	**40/–**	—	—	—	—	—	—	—	—	—
,, 6″	**40/–**	**41/–**	**42/–**	**44/–**	**46/–**	**48/–**	**50/–**	**52/–**	**54/–**	**56/–**	**58/–**	**60/–**
,, 7″	**42/–**	**43/–**	**44/–**	**46/–**	**48/–**	**50/–**	**52/–**	**54/–**	**56/–**	**58/–**	**60/–**	**62/–**
,, 8″	**45/–**	**46/–**	**47/–**	**49/–**	**51/–**	**53/–**	**55/–**	**57/–**	**59/–**	**61/–**	**63/–**	**65/–**
,, 9″	**48/–**	**49/–**	**50/–**	**52/–**	**54/–**	**56/–**	**58/–**	**60/–**	**62/–**	**64/–**	**66/–**	**68/–**
,, 10″	—	—	**53/–**	**55/–**	**57/–**	**59/–**	**61/–**	**63/–**	**65/–**	**67/–**	**69/–**	**71/–**
,, 11″	—	—	**56/–**	**58/–**	**60/–**	**62/–**	**64/–**	**66/–**	**68/–**	**70/–**	**72/–**	**74/–**
,, 12″	—	—	**59/–**	**61/–**	**63/–**	**65/–**	**67/–**	**69/–**	**71/–**	**73/–**	**75/–**	**77/–**

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SPRING BALANCES.

Fig. 3120. TRADE PLATFORM BALANCE.

Prices include plugging ready for stamping.

Dials are graduated either in pounds only, or cwts. qrs. lbs. as desired.

To weigh 3 cwts. × 1 lb., with 16″ Brass or Enamelled Dial, with 24″×20″ Scale—
With back, **300**/– No back, **288**/–

To weigh 5 cwts. × 2 lb., with 16″ Brass or Enamelled Dial, with 28″×24″ Scale—
With back, **400**/– No back, **386**/–

To weigh 10 cwt. × 4 lb., with 18″ Brass or Enamelled Dial, with 30″×30″ Scale—
With back, **550**/– No back, **535**/–

If fitted with wheels, 3 cwt. and 5 cwt., **16**/–, and 10 cwt., **70**/– each extra.

If with Double Index, one figured by 10 lb., the other by ¼ cwt., **16**/– extra.

If fitted with improved pattern relieving gear, approved by Board of Trade, up to 5 cwts., **75**/– and 10 cwts., **90**/– each extra.

If fitted with Brass Rim and Plate-glass Cover, for 16″ dial, **50**/–, and 18″ dial **66**/– exta.

Fig. 3121.

COMBINED TENSION OR COMPRESSION INDICATOR AND SPRING BALANCE.

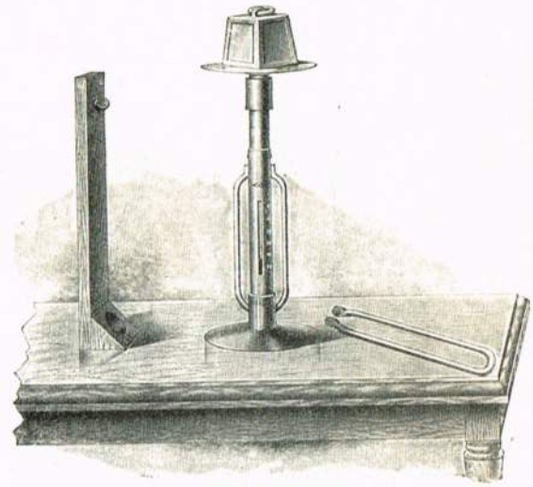

Fig. 3121A.
Showing this instrument in use as an ordinary spring balance.

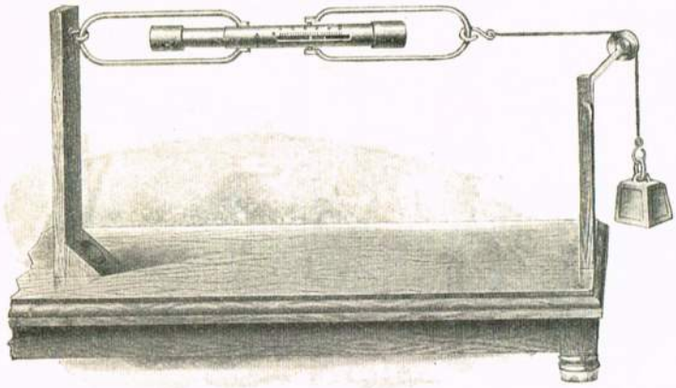

Fig. 3121B.
Showing instrument with scale pan and base removed, and the instrument indicating a tensile strength.

This apparatus will be found almost invaluable by teachers, demonstrators and experimenters in physical science schools, laboratories, and the like, and may be used for measuring both tensile and compression stresses, and also for indicating weights, as shown in the three illustrations.

To weigh	Length of Marking.	Price.
1 lb. × 1 oz.	1 inch	**35**/– each
2 lb. × 1 oz.	2 ,,	**40**/– ,,
3 lb. × 2 oz.	1½ ,,	**35**/– ,,
4 lb. × 2 oz.	2 ,,	**41**/– ,,
6 lb. × 4 oz.	1½ ,,	**35/6** ,,
10 lb. × 4 oz.	2½ ,,	**42**/– ,,
10 lb. × 8 oz.	1¼ ,,	**36**/– ,,
20 lb. × 8 oz.	2½ ,,	**42**/– ,,

The above prices do not include any fittings.

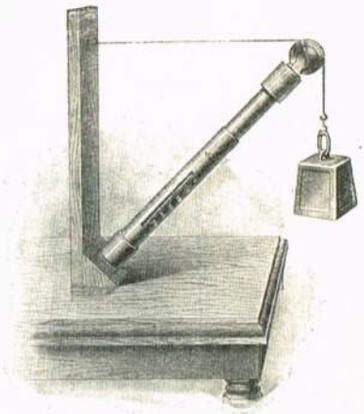

Fig. 3121C.
Showing instrument with extension links removed and a small pulley substituted for scale pan. This is suitable for indicating compression stresses.

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WEIGHING MACHINES.

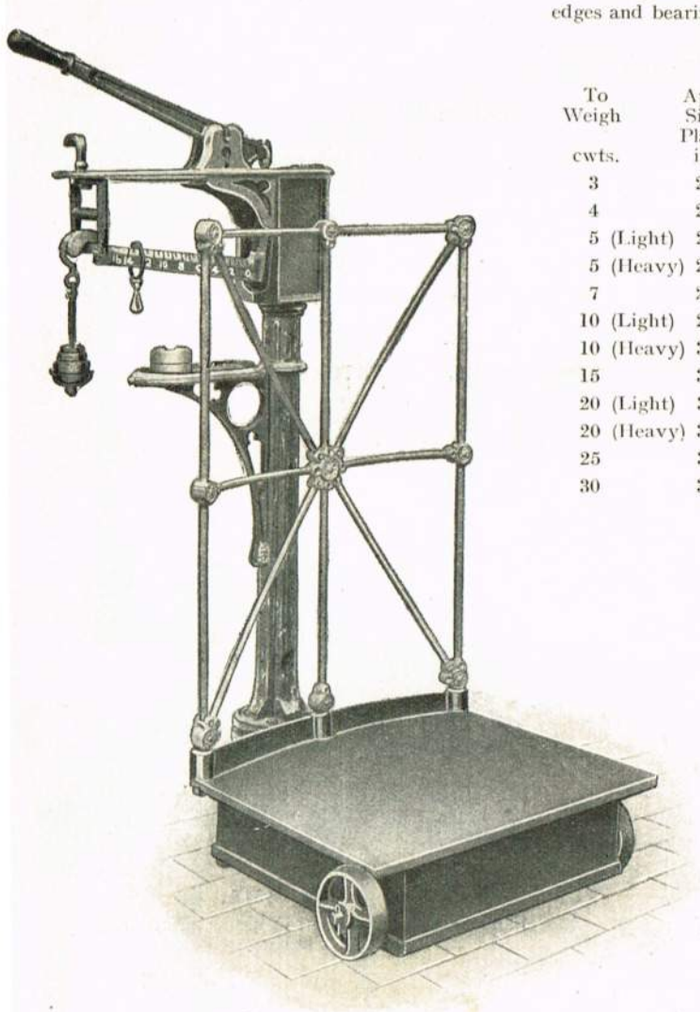

Fig. 3122.

Platform Weighing Machine, fitted with relieving apparatus, steel knife-edges and bearings. Suitable for Farmers, Grocers, Bakers, etc.

To Weigh cwts.	Approx. Size of Platform inches.	Price with back rail £ s. d.	Price without back rail £ s. d.	Price with back rail and W.I. folded wings £ s. d.	Extra to weigh in English and Kilog £ s. d.
3	20×23	**10 15 0**	**10 5 0**	**13 2 6**	**0 17 6**
4	20×25	**10 18 0**	**10 8 0**	**13 10 0**	**0 17 6**
5 (Light)	22×24	**11 15 0**	**11 5 0**	**14 0 0**	**0 17 6**
5 (Heavy)	22×26	**12 17 6**	**12 7 6**	**15 17 6**	**0 17 6**
7	26×30	**17 0 0**	**16 10 0**	**19 10 0**	**1 0 0**
10 (Light)	28×28	**17 8 6**	**17 0 0**	**20 0 0**	**1 0 0**
10 (Heavy)	31×35	**21 0 0**	**20 10 0**	**24 12 6**	**1 0 0**
15	32×38	**23 2 6**	**22 12 6**	**27 3 6**	**1 5 0**
20 (Light)	32×34	**23 2 6**	**22 12 6**	**27 3 6**	**1 5 0**
20 (Heavy)	36×36	**30 15 0**	**29 0 0**	**35 8 0**	**1 5 0**
25	36×36	**32 16 0**	**30 15 0**	**37 8 6**	**1 10 0**
30	38×40	**34 17 0**	**32 16 0**	**40 10 0**	**1 12 6**

Wrought-iron folded wings are hinged U. Straps bolted to platform for holding bulky articles. Machines up to 5 cwt. capacity are mounted on 2 wheels; above that size mounted on 4 wheels.

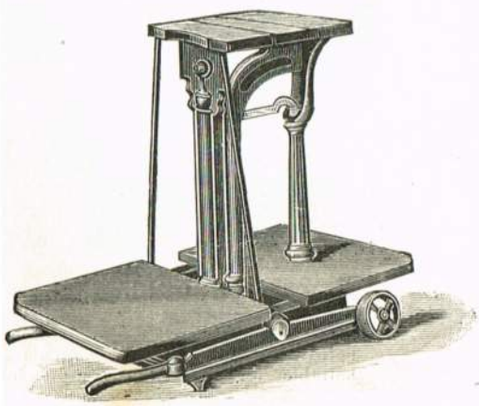

Fig. 3123.

Strong Even-Balance Weighing Machine. For Market Gardeners, Farmers, Warehouses, etc.

To weigh	2	3	4 cwts.
Size of Front Boards ...	14×18½	17×20	18×22 inches.
With Wood Boards ...	**£5 15 0**	**£6 15 0**	**£7 15 0** each.
With Iron Plates	**£7 10 0**	**£9 0 0**	**£9 15 0** each.

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WEIGHING MACHINES.

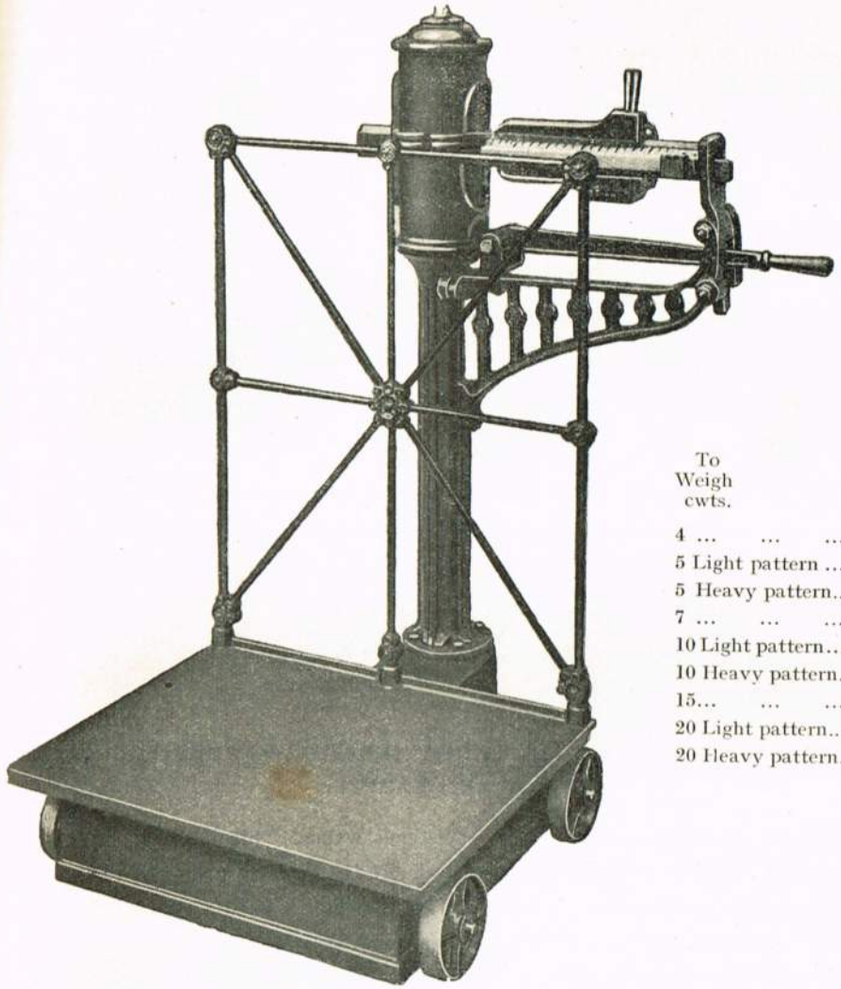

Fig. 3124.

Improved NO-LOOSE Weights Platform Machine. Stamped and fitted with back rail. Entirely dispensing with loose weights. Very quick and accurate. Fitted with relieving apparatus, steel knife edges, and bearings. Machines up to 5 cwts. capacity are mounted on 2 wheels, above 5 cwt. are mounted on 4 wheels. Wrought iron wings can be fitted to plate for holding bulky articles.

To Weigh cwts.	Approx. Size of goods plate inches	Price with back rail £ d. s.	Price without back rail £ s. d.	Price with W.I. folded wings £ s. d.
4	20×25	**17 8 6**	**16 10 0**	**20 10 0**
5 Light pattern ...	22×24	**18 6 6**	**17 16 0**	**21 2 6**
5 Heavy pattern..	22×26	**19 9 6**	**18 19 6**	**22 11 0**
7	26×30	**23 10 6**	**22 8 6**	**26 13 0**
10 Light pattern...	28×28	**23 11 6**	**22 19 6**	**27 13 6**
10 Heavy pattern.	31×35	**27 3 6**	**26 3 0**	**31 15 0**
15...	32×38	**29 14 6**	**28 14 0**	**35 17 6**
20 Light pattern...	32×34	**30 15 0**	**29 15 0**	**26 18 0**
20 Heavy pattern.	36×36	**37 18 6**	**36 8 0**	**45 0 0**

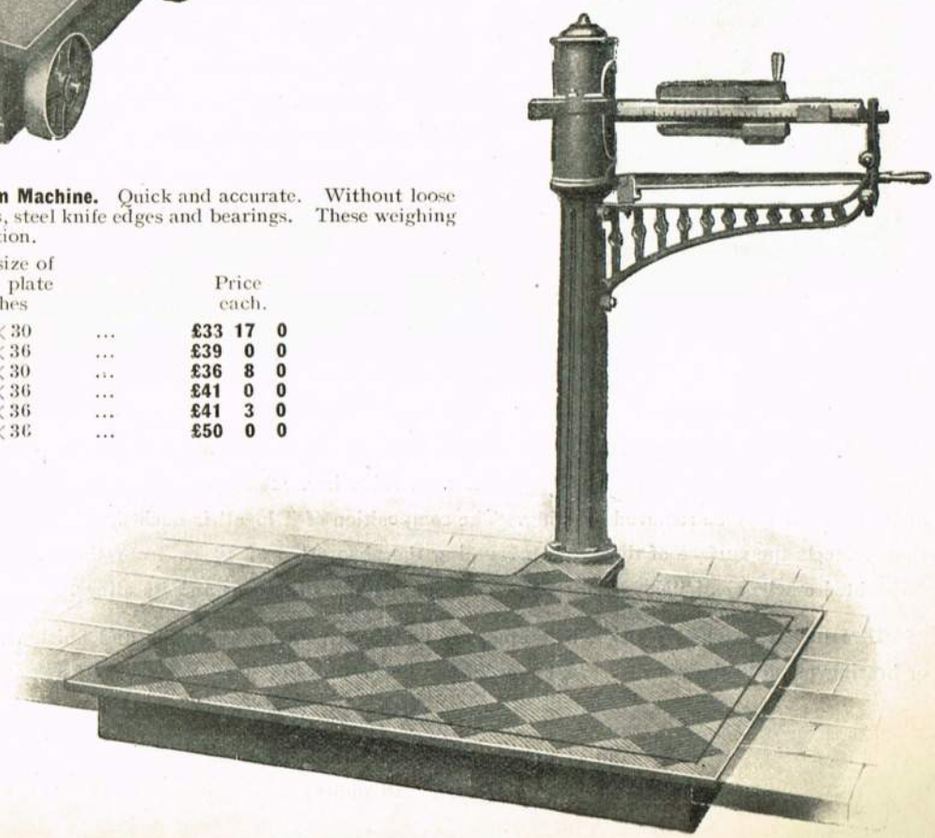

Fig. 3125. Improved Dormant Platform Machine. Quick and accurate. Without loose weights. Fitted with relieving apparatus, steel knife edges and bearings. These weighing machines must be stamped when in position.

To weigh cwts.	Approx. size of goods plate inches	Price each.
10 ...	30×30 ...	**£33 17 0**
10 ...	36×36 ...	**£39 0 0**
15 ...	30×30 ...	**£36 8 0**
15 ...	36×36 ...	**£41 0 0**
20 ...	36×36 ...	**£41 3 0**
20 ...	48×36 ...	**£50 0 0**

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SOLDERING AND BRAZING COMPOUNDS.

Fig. 3200. T. C. Jones & Co., Ltd. "KAINA" SOFT SOLDER COMPOUND.

The fluxes most commonly employed for **Soft Soldering** are resin, zinc chloride (often termed soldering water or "killed hydrchloric acid") and various fatty compounds containing zinc chloride. While zinc chloride has an undobutedly powerful action as a cleansing medium, it is open to the disadvantage that corrosion is liable to occur with the subsequent failure of the soldered joint. Resin is free from this objection, but on the other hand has a great tendency to spread over the surface of the components to be soldered and is difficult to remove. "Kaina" Soldering Compound is a **rapid** and **powerful cleanser** entirely **non-corrosive** and makes an **exceptionally strong joint.** It is harmless to the skin and evolves no unpleasant vapour when heated. For all high-class work such as scientific instruments, wireless and electrical installations, gas meters, etc., this flux cannot be surpassed.

Directions for use.—Clean the metal to be soldered with a smooth file or penknife, and finish with emery cloth. Rub a small portion of the "Kaina" Compound on with the finger and apply the solder thinly with the copper bit.

PRICES.

Tin of approximately 2 ounces ... ... **1/3** each.

Fig. 3201. T. C. Jones & Co., Ltd. "NOVA" BRAZING POWDER FOR COPPER, BRASS AND BRONZE.

For hard soldering, or as it is sometimes termed "brazing," a surface both mechanically and chemically clean is essential. It is necessary also thht the surfaces to be joined should be protected as much as possible from the atmosphere during soldering. This can best be done by building round the work clean coke or fire brick. Resin is sometimes employed as a flux but has the disadvantage above mentioned, while a solution of phosphoric acid in alcohol is costly and unstable. Borax at the present time is probably the most popular flux for this class of work but leaves a strongly adherent glassy scale. Copper is not an easy metal to weld, its high heat conductivity renders the use of large blow pipes a necessity and considerable practice is required or the metal may be "burned." In the molten state copper readily forms cuprous oxide which dissolves in the metal, rendering it extremely brittle. Further, copper has a strong affinity when melted, for gases such as hydrogen and carbon monoxide, which may be derived from the blowpipe flame. On solidification these occluded gases are evolved, leaving the metal spongy, or even a mass of blow holes. A suitable flux is absolutely necessary to guard against these possibilities. "Nova" Powder has been specially prepared for hard soldering or brazing as well as silver soldering. It is rapid and effective in action and does not leave a glass hard scale after soldering. The scale formed is easily removed by the application of cold water and a brush or may be removed by filing. The composition of "Nova" is such that it acts as a deoxydising agent and at the same time protects the surface of the metal preventing the absorption of gases from the flame. Protracted tests have proved the undoubted efficiency of "Nova" for the successful welding of copper and its alloys.

Directions for use.—Clean the metal parts to be brazed with a smooth file and finish with emery cloth. Apply the strip brass or brazing metal to the powder. This powder can be used dry or wet.

PRICES.

Tin of approximately 4 ounces ... ... **2/6** per tin.
" " 18 ounces ... ... **7/6** "

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WELDING COMPOUNDS.

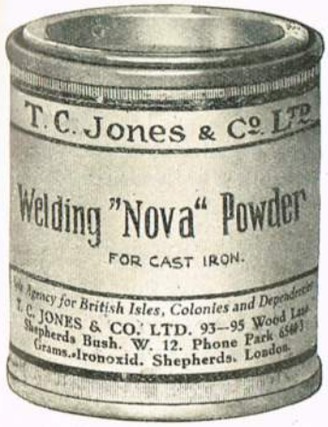

Fig. 3202. T. C. Jones & Co., Ltd. " NOVA " WELDING POWDER FOR CAST IRON.

One of the chief difficulties in welding grey cast iron is to avoid the formation of white iron which is hard, brittle and very difficult to file. In grey iron the carbon (usually present to the extent of 3 or 4%) exists mainly in the form of graphite, but in white iron this element is present in the " combined " state and the metal possesses the characteristics above mentioned. During welding a portion of the graphite is of necessity burnt out by the blow pipe flame and a certain amount of silicon is also lost. If the flame is too strongly oxydising these reactions take place rapidly and are assisted by the oxide of iron simultaneously formed. If on the other hand the oxyacetylene flame penetrates the metal, carbon will be absorbed and white iron is certain to result. A successful weld is a matter of skill, aided by the selection of suitable welding rods and fluxes. By the use of **" Nova " Welding Powder** the formation of white iron is considerably hindered or entirely prevented during welding. It acts as a powerful flux, materially assisting the " flow " of the iron in addition to serving as a protective agent. In common with all " Nova " and " Kaina " preparations, this powder is manufactured under strict laboratory control, resulting in uniform products of the highest quality.

PRICES.

Tin of approximately 18 ounces	**3/2** per tin.
,, ,, 2¼ lbs.	**4/4** ,,
In 1 cwt. and 2 cwt. Kegs	**2/-** per lb.

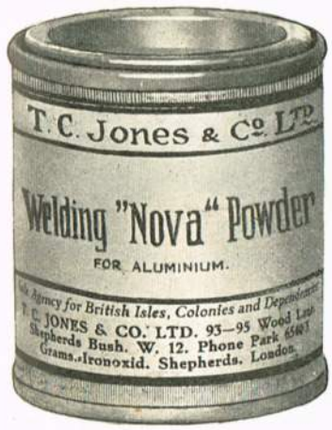

Fig. 3203. T. C. Jones & Co., Ltd. "NOVA" WELDING POWDER FOR ALUMINIUM.

For the satisfactory welding of Aluminum—the most difficult of all common metals to weld—the use of a suitable flux is *sine que non*. Aluminium has a strong affinity for oxygen when molten, resulting in the formation of almost infusible Alumina (Al_2O_3) the melting point of which is in the neighbourhood of 2,500°C., hence the difficulty of making a satisfactory weld will be readily appreciated. The production of a flux capable of dissolving alumina at a relatively low temperature and protecting the heated metal from atmospheric oxydation, has been the subject of considerable research. It is only comparatively recently that the efforts of chemists have been successful in this direction.

After exhaustive experiments **" Nova " Welding Powder for Aluminium** has shown itself to be superior to all welding powders for this metal, it dissolves alumina at a relatively low temperature and ensures with certainty a homogeneous weld.

PRICES.

Tin of approximately 4 ounces	**8/9** each.
,, ,, 18 ounces	**35/-** each.

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HAIR CLIPPERS, GOGGLES, Etc.

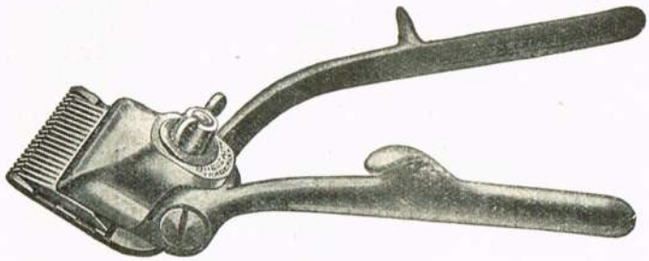


Fig. 3204.

Brown & Sharpe "Bressant" Hair Clippers are simple in construction and therefore will not readily get out of order. The cutting movement is actuated by a spiral spring contained in a screw shell. Construction permits the plates being detached whilst the spring remains set. The spiral gives a uniform tension in any position.

No.	000	00	0	1	2	3
	To cut hair nearly as close as shaving.	$\frac{1}{64}$in. long.	$\frac{1}{32}$in. long.	$\frac{1}{8}$in. long.	$\frac{1}{4}$in. long.	$\frac{5}{16}$in. long.
Price, each	**13/6**	**13/6**	**13/6**	**13/6**	**15/–**	**17/6**

BROWN AND SHARPE HAIR CLIPPER PARTS.

"Bressant."

No.	Name.	
20	Bottom Plate for No. 000, 00 and 0 Clipper ...	**6/3** each
21	" " 1 Clipper	**6/3** "
22	" " 2 "	**8/4** "
23	" " 3 "	**10/5** "
24	Cap	**2/1** "
25	Lever	**4/2** "
26	Lever	**4/2** "
27	Top Plate for No. 0 Clipper, fine tooth, 25 teeth	**3/2** "
27A	Top-Plate for No. O Clipper, coarse tooth, 13 teeth	**3/2** each
28	Top Plate for Nos. 1, 2 and 3 Clippers	**3/2** "
29	Bolt for 000 and 00, –/**8**; 0 to 3	–/**5** "
30	Plate Screws	–/**3** "
32	Spring	–/**3** "
32	" Screw Shell	–/**5** "
33	" Cap	–/**2** "
34	Nut	–/**10** "
35	Spring Washer	–/**3** "

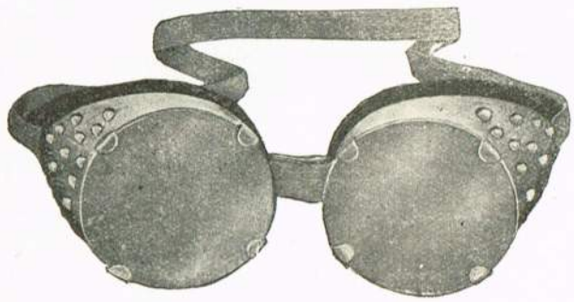


Fig. 3205. Welding Goggles.

For protecting the eyes against glare.

Dark glass.

Price, **4/6** per pair.

Fig. 3208. Patent Unbreakable File Handles.
No. 1, **60**/– gross. No. 2, **72**/– gross.

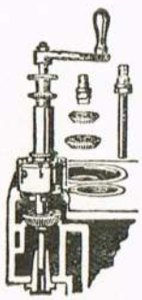
Fig. 3206. Patent Unbreakable Lathe Can.

No. 1. $6\frac{1}{4} \times 6$ inches, $2\frac{1}{4}$ pints, **10/–** each.

No. 2. $8 \times 7\frac{3}{4}$ inches, 1 gallon, **15/–** each.

VALVE RE-SEATERS.

For Repairing any type of Automobile and Stationary Engine Valves.



SIMPLE IN OPERATION :—The lower end of the milling spindle is fitted with the suitable milling cutter F and with the guide bolt B. The apparatus is now inserted into the cylinder in the place of the valve-cap. By turning the upper part of the apparatus O the spindle is lowered down until the milling cutter is in contact with the seat and exerts a moderate pressure on the valve seat. A spring contained in the apparatus controls the pressure. By turning the crank K the valve seat is finished and trued off within a few minutes.

By means of this tool the valve-seat can quickly and easily be repaired, thus doubling the life of the valve and helping to maintain engine tune for long periods.

Fig. 3207. Price complete ... ... **£12 0 0.**

PRICE INCLUDES : 6 interchangeable guide bolts of the following sizes—7, 8, 9, 10, 11, 12 m/m ; 15 interchangeable double-sided milling cutters of the following sizes—30, 32.5, 35, 37.5, 40, 42.5, 45, 47.5, 50, 52.5, 55, 60, 65, 70, 75 m/m.

SPARE PARTS.

Tool, **£5 10s.** Guide bolts, 7, 8, 9, 10, 11, 12 m/m. **3s. 6d.** each.

Cutters	30	32	35	37	40	42	45	47	50	52	55	60	65	70	75 m/m
Price each	**5/–**	**5/–**	**5/–**	**6/–**	**6/–**	**6/–**	**7/–**	**7/–**	**8/–**	**8/–**	**8/6**	**9/–**	**9/6**	**10/–**	**12/–**

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PAINT AND VARNISH BRUSHES.

Fig. 3209. "Exhibition" Quality.
Made from the finest selected pure black bristle

Fig. 3210. "Stadium" Quality.
Made from pure black bristle.

FLAT TIN-BOUND VARNISH BRUSHES.

	Size, inches ...	$1\times\frac{5}{8}$	$1\frac{1}{2}\times\frac{5}{8}$	$2\times\frac{3}{4}$	$2\frac{1}{2}\times{}^{3}/_{16}$	$3\times\frac{7}{8}$	$3\frac{1}{2}\times\frac{7}{8}$	$4\times\frac{7}{8}$	
Fig. 3209.	Price	**6/9**	**12/4**	**21/–**	**30/9**	**44/3**	**63/–**	**75/–**	per dozen
Fig. 3210.	Price	**5/8**	**8/3**	**11/3**	**15/9**	**22/6**	**34/6**	**45/–**	,,

Fig. 3211.

Fig. 3212.

BEST HOG HAIR FITCHES.

Fig. 3211. Round Pattern. **Fig. 3212. Flat Pattern.**

Numbers	1	2	3	4	5	6	7	8	9	10	11	12
Price per dozen	**3/–**	**3/–**	**3/–**	**3/9**	**4/6**	**5/–**	**6/–**	**7/3**	**8/9**	**9/9**	**12/–**	**13/6**

Fig. 3213.
BEST ENGLISH STRING-TIED SASH TOOLS.
Pure Lily Bristles.

Nos.	1	2	3	4	5	6
Price per dozen ...	**5/6**	**6/9**	**9/–**	**11/–**	**15/–**	**21/–**
Nos.	7	8	9	10	12	
Price per dozen	**28/–**	**36/–**	**46/–**	**60/–**	**92/–**	

Fig. 3214.
METAL-BOUND SASH TOOLS.
Pure Black Bristles.

Nos.	0	1	2	3	4	5
Price per dozen ...	**2/6**	**3/–**	**3/9**	**4/3**	**5/6**	**6/3**
Nos.	6	7	8	10	12	
Price per dozen	**10/–**	**14/–**	**16/–**	**23/–**	**29/–**	

Fig. 3215.
CAMEL HAIR MOPS. Dome Shape.

Nos.	2	3	4	5	6
Price per gross	**30/–**	**39/–**	**45/–**	**57/–**	**66/–**

Assorted, 2 dozen per card ... **5/9** each card.

Fig. 3216.
METAL BOUND.

Best quality aluminium bound. Pure Black Bristle.

Nos.	0	1	2	3	4	5
Price per dozen ...	**3/9**	**4/3**	**5/–**	**5/6**	**6/6**	**7/9**
Nos.	6	7	8	10	12	
Price per dozen	**10/–**	**12/–**	**18/–**	**29/–**	**38/–**	

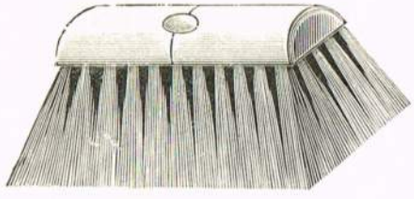

Fig. 3217.
SCAVENGER BROOMS.
Pure Bahia Bass.

Number of knots	14×5	15×5	16×5	17×5	18×6	20×6
Per dozen ...	**49/6**	**54/–**	**59/–**	**62/6**	**66/6**	**74/–**

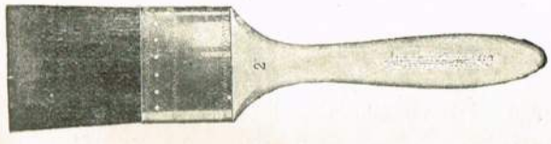

Fig. 3218.
FLAT BEVELLED VARNISH BRUSH.

With seamless copper ferrules. Will not burst nor rust. Made of stiff selected black bristles, specially fixed, rendering unnecessary preliminary breaking in.

Size, inches	$1\times{}^{9}/_{16}$	$1\frac{1}{2}\times\frac{5}{8}$	$2\times\frac{3}{4}$	$2\frac{1}{2}\times{}^{13}/_{16}$	$3\times\frac{7}{8}$
Price per dozen	**10/6**	**16/–**	**26/–**	**38/–**	**52/6**

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WASTE, RAWLPLUGS, Etc.

Fig. 3220. "Foliac" Solid Belt Dressing will immediately and effectively stop belts slipping, is quite harmless for all belts, and can be applied without stopping the machinery.

Price, **2/-** per bar.

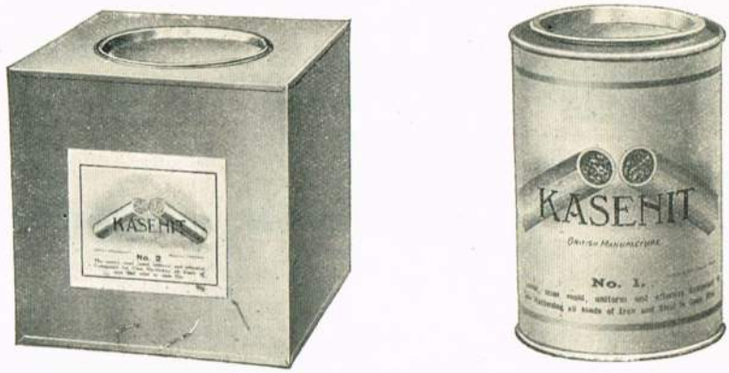


Fig. 3221 "Kasenit" Case-Hardening Compound. Always effective under all different heat conditions. Economical in use.

No. 1 "Kasenit." A specially refined compound for high-class work.

Size	½lb.	1lb.	3lb.	7lb.	14lb.	28lb.	½cwt.	1cwt.
Price, each ...	**1/5**	**2/6**	**7/3**	**16/6**	**32/-**	**64/-**	**126/6**	**252/-**

No. 2 "Kasenit." For ordinary shop use.

Size	14lb.	28lb.	1 cwt.
Price, each	**23/9**	**47/6**	**186/8**

No. 4 "Kasenit." For case-hardening in closed boxes.

1 cwt. bags, **16/-** per cwt.

Fig. 3222. Cotton Waste of good reliable quality in ½-cwt. bags.

White price, **44/-** cwt.

Coloured price, **32/-** cwt.

Fig. 3223. Rags, well washed..

White, price, **53/6** cwt.
Coloured, price, **42/6** cwt.

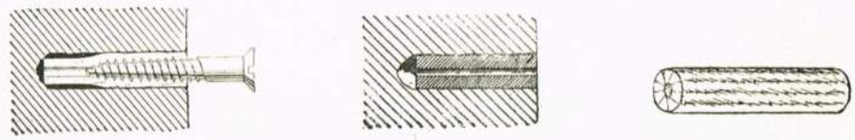
Fig. 3225. Fish and Ring Brand Leather Reviver, made in all colours, for renovating the linings of motor cars, etc. Unaffected by climatic conditions
Sizes, **1/6, 2/3, 3/9, 7/-**
Quarts, **12/6.** ½ gallons, **20/-.**
1 gallon, **36/-** each.

Fig. 3224. RAWLPLUGS.

The Rawlplug is a small patent fibre tube made of stiffened, tough and specially treated fibre. To fix, you make a small neat hole (smaller than the head of the screw) in the material with the Rawlplug Tool or a drill and insert the Rawlplug. When you turn a screw into the Rawlplug the latter expands and grips the wall like a vice, at the same time the screw is held firmly in position by a perfect thread being automatically formed in the fibre.

Outfit—Household.—50 No. 8 assorted lengths plugs. Tool holder and bit. A supply of screws, screw eyes, cup-hooks, etc. Price, **3/6.**

Outfit—Mechanics.—100 No. 8 assorted lengths plugs. Tool holder, One bit for brick, concrete, etc., and one for plaster. A good supply of screws, screw eyes, hooks, etc. Price, **5/6** each.



Rawlplugs only in boxes of 100.

Size of Rawlplug.	Will take the following sizes of screws.	Length of Rawlplugs. ½″	⅝″	¾″	1″	1½″	2″	2½″	Assorted Lengths.
3	No. 3, 2 and 1	**1/4**	**1/5**	**1/6**	**1/8**	—	—	—	**1/7**
6	,, 6, 5 ,, 4	**1/6**	**1/7**	**1/9**	**2/-**	—	—	—	**1/9**
8	,, 8 ,, 7	**1/9**	**1/11**	**2/1**	**2/5**	**3/-**	**3/6**	—	**2/6**
10	,, 10 ,, 9	**2/-**	**2/2**	**2/4**	**2/9**	**3/5**	**4/1**	—	**2/10**
12	,, 12 ,, 11	—	—	**2/9**	**3/2**	**4/-**	**4/9**	—	**3/6**
14	,, 14 ,, 13	—	—	**3/3**	**3/9**	**4/9**	**5/8**	—	**4/6**

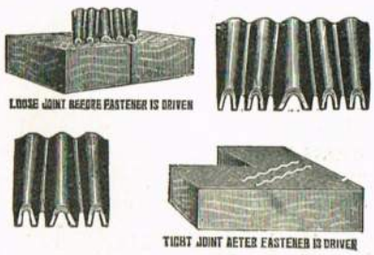


Fig. 3226. Carey's Corrugated Fasteners. Made of Cold Rolled Steel.

Various widths, cut to size in the different numbers of corrugations used, and put up in paper cartons of 500 and 1,000. Also packed in bulk in cases, kegs and barrels.

List Prices per Thousand.

Number of Corrugations.	Inches in Depth. ¼	⅜	½	⅝	¾	⅞	1
No. 3	**2/6**	**3/2**	**3/7**	**4/2**	**4/10**	**5/8**	**6/1**
No. 4	**3/2**	**4/-**	**4/5**	**5/5**	**6/1**	**7/4**	**7/9**
No. 5	**3/9**	**5/-**	**5/5**	**7/1**	**7/9**	**9/2**	**10/-**
No. 6	**4/7**	**5/10**	**6/3**	**7/9**	**9/-**	**10/8**	**11/11**
No. 7	**5/5**	**6/8**	**7/6**	**9/2**	**10/5**	**12/6**	**14/-**
No. 8	**6/3**	**7/6**	**8/9**	**10/8**	**12/1**	**14/5**	**16/1**

When ordering give depth and number, as ¼-in., No. 3; ½-in., No. 4, etc.

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SILVER STEEL, KEYS, Etc.

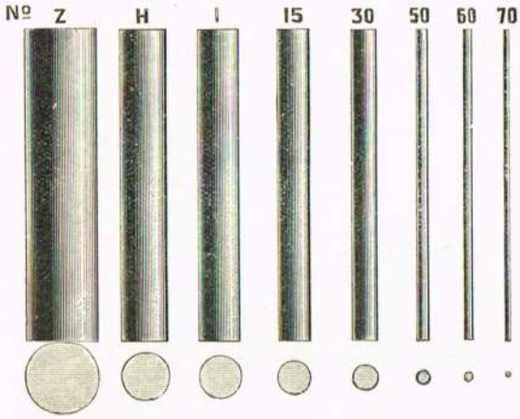


Fig. 3227. BRIGHT DRAWN SILVER STEEL WIRE.

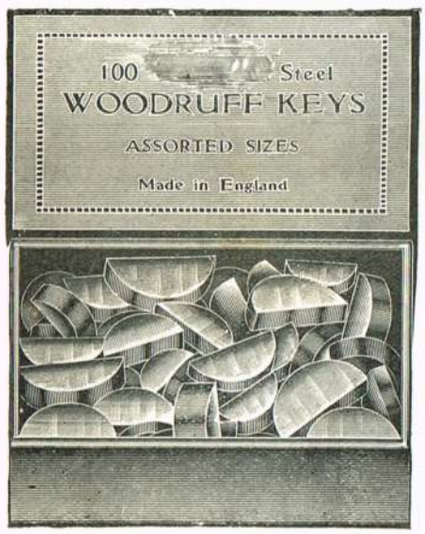
For the manufacture of twist drills, taps, etc.

Lancashire pinion wire gauge	Diam. m/m	Price per lb.	Lancashire pinion wire gauge	Diam. m/m	Price per lb.
No. 15 and larger	—4·52	**2/6**	66—68	0·82—0·76	**10/–**
16—30	4·51—3·17	**2/9**	69—70	0·75—0·68	**11/–**
31—38	3·16—2·56	**3/–**	71—73	0·67—0·58	**12/–**
39—46	2·55—2·00	**3/6**	74	0·57 0·55	**13/–**
47—50	1·99—1·75	**4/–**	75	0·54—0·50	**13/6**
51—54	1·74—1·39	**4/10**	76	0·49—0·45	**14/–**
55—57	1·38—1·06	**6/–**	77	0·44—0·40	**15/–**
58—60	1·05—0·99	**7/–**	78	0·39—0·38	**16/–**
61—62	0·98—0·91	**8/–**	79	0·37—0·35	**17/–**
63—65	0·90—0·83	**9/–**	80	0·34—0·33	**18/–**

Fractional Sizes.

Diameter, inches	up to $^3/_{16}$	$^{11}/_{64}$ to $^9/_{64}$	$\frac{1}{8}$ to $^7/_{64}$	$^3/_{32}$	
Diameter, m/m	up to 5	$4\frac{1}{2}$ to $3\frac{1}{2}$	3	$2\frac{1}{2}$.2	
Body size, B.A.	0 to 2	3 to 4	5 to 6	7 to 8	
Price per lb.....	**2/6**	**2/9**	**3/0**	**3/6**	
Diameter, inches	$^5/_{64}$	$^1/_{16}$	$^3/_{64}$	—	$^1/_{32}$
Diameter, m/m	—	$1\frac{1}{2}$	—	1	—
Body size, B.A.	9	10	12	14	16
Price per lb....	**4/–**	**4/10**	**6/–**	**7/–**	**10/–**

Fig. 3228. WOODRUFF KEYS IN ORDINARY STEEL.



The Woodruff system of keying, reaching much deeper into a shaft than the ordinary method, is capable of standing much greater strains. It is impossible for a Woodruff to roll over in its seat.

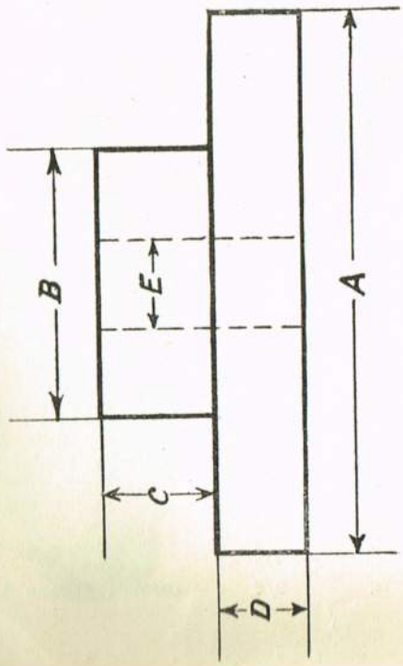
The cutting of the key-seat and the fitting of the key does not require skilled labour.

Made in all sizes from best quality steel, $\frac{1}{2}''$ up to $1\frac{1}{2}''$ diameter × $^1/_{16}''$ up to $\frac{3}{8}''$ thickness.

Also supplied in boxes containing 100 keys in the most useful sizes. **8/6** per box.

Size No.	Diam. inches	Thickness inches	Price per 100	Size No.	Diam. inches	Thickness inches	Price per 100
1	$\frac{1}{2}$	$^1/_{16}$	**3/4**	21	$1\frac{1}{4}$	$\frac{1}{4}$	**17/9**
2	$\frac{1}{2}$	$^3/_{32}$	**3/4**	D	$1\frac{1}{4}$	$^5/_{16}$	**20/6**
3	$\frac{1}{2}$	$\frac{1}{8}$	**3/6**	E	$1\frac{1}{4}$	$\frac{3}{8}$	**23/4**
4	$\frac{5}{8}$	$^3/_{32}$	**3/4**	22	$1\frac{3}{8}$	$\frac{1}{4}$	**21/6**
5	$\frac{5}{8}$	$\frac{1}{8}$	**3/8**	23	$1\frac{3}{8}$	$^5/_{16}$	**24/8**
6	$\frac{5}{8}$	$^5/_{32}$	**4/5**	F	$1\frac{3}{8}$	$\frac{3}{8}$	**27/9**
61	$\frac{5}{8}$	$^3/_{16}$	**5/2**	24	$1\frac{1}{2}$	$\frac{1}{4}$	**25/9**
7	$\frac{3}{4}$	$\frac{1}{8}$	**4/2**	25	$1\frac{1}{2}$	$^5/_{16}$	**29/1**
8	$\frac{3}{4}$	$^5/_{32}$	**5/–**	G	$1\frac{1}{2}$	$\frac{3}{8}$	**33/2**
9	$\frac{3}{4}$	$^3/_{16}$	**5/9**	152	1	$\frac{3}{8}$	**15/8**
91	$\frac{3}{4}$	$\frac{1}{4}$	**8/–**	141	$^{61}/_{64}$	$\frac{1}{4}$	**12/9**
10	$\frac{7}{8}$	$^5/_{32}$	**7/1**	131	$^{15}/_{16}$	$^5/_{16}$	**13/–**
11	$\frac{7}{8}$	$^3/_{16}$	**7/8**	16	$1\frac{1}{8}$	$^3/_{16}$	**12/4**
12	$\frac{7}{8}$	$^7/_{32}$	**8/5**	17	$1\frac{1}{8}$	$^7/_{32}$	**13/5**
A	$\frac{7}{8}$	$\frac{1}{4}$	**9/5**	18	$1\frac{1}{8}$	$\frac{1}{4}$	**14/7**
121	$^{53}/_{64}$	$\frac{1}{4}$	**8/8**	C	$1\frac{1}{8}$	$^5/_{16}$	**17/1**
13	1	$^3/_{16}$	**9/9**	161	1	$^5/_{16}$	**16/5**
14	1	$^7/_{32}$	**10/8**	19	$1\frac{1}{4}$	$^3/_{16}$	**15/–**
15	1	$\frac{1}{4}$	**11/11**	20	$1\frac{1}{4}$	$^7/_{32}$	**16/5**
B	1	$^5/_{16}$	**13/8**				

Fig. 3229. CHUCK BACK AND CATCH PLATE CASTINGS.



No.	A inches	B inches (Best quality.)	C inches	D inches (Close grained iron.)	E inches	Weight lbs.	Price each
1	2	$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{1}{2}$	—	$\frac{1}{2}$	**6d.**
2	$2\frac{1}{2}$	$1\frac{3}{8}$	$\frac{5}{8}$	$\frac{1}{2}$	—	$\frac{3}{4}$	**9d.**
3	3	$1\frac{1}{2}$	$\frac{5}{8}$	$^9/_{16}$	—	$1\frac{1}{4}$	**1/–**
4	$3\frac{1}{2}$	$1\frac{3}{4}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{1}{2}$	2	**1/2**
5	4	2	$^{13}/_{16}$	$\frac{5}{8}$	$\frac{1}{2}$	$2\frac{1}{2}$	**1/6**
6	$4\frac{1}{2}$	$2\frac{1}{4}$	$\frac{7}{8}$	$^{11}/_{16}$	$\frac{3}{4}$	$3\frac{1}{2}$	**2/–**
7	$4\frac{1}{2}$	3	$1\frac{1}{4}$	$^{11}/_{16}$	$\frac{3}{4}$	5	**3/2**
8	5	$2\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{3}{4}$	5	**3/2**
9	5	$3\frac{3}{8}$	$1\frac{1}{2}$	$\frac{3}{4}$	1	7	**3/6**
10	$5\frac{1}{2}$	$2\frac{3}{4}$	$1\frac{1}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	6	**3/–**
11	$5\frac{1}{2}$	$3\frac{3}{4}$	$1\frac{5}{8}$	$\frac{3}{4}$	1	$8\frac{1}{2}$	**4/4**
12	6	3	$1\frac{1}{4}$	$^{13}/_{16}$	$\frac{3}{4}$	8	**3/10**
13	6	4	$1\frac{3}{4}$	$^{13}/_{16}$	1	11	**5/–**
14	$6\frac{1}{2}$	$2\frac{1}{2}$	1	$\frac{7}{8}$	$\frac{3}{4}$	$8\frac{1}{2}$	**4/–**
15	$6\frac{1}{2}$	$3\frac{3}{4}$	$1\frac{5}{8}$	$\frac{7}{8}$	1	12	**5/6**
16	$6\frac{1}{2}$	$4\frac{3}{4}$	2	$\frac{7}{8}$	$1\frac{1}{4}$	16	**7/–**
17	$7\frac{1}{2}$	$2\frac{3}{4}$	$1\frac{1}{8}$	$^{15}/_{16}$	$\frac{3}{4}$	$12\frac{1}{2}$	**5/6**
18	$7\frac{1}{2}$	4	$1\frac{3}{4}$	$^{15}/_{16}$	1	16	**7/–**
19	$7\frac{1}{2}$	5	$2\frac{1}{8}$	$^{15}/_{16}$	$1\frac{1}{4}$	21	**9/–**
20	$8\frac{1}{2}$	3	$1\frac{1}{4}$	1	$\frac{3}{4}$	17	**7/6**
21	$8\frac{1}{2}$	$4\frac{1}{4}$	$1\frac{7}{8}$	1	1	21	**9/–**
22	$8\frac{1}{2}$	$5\frac{1}{2}$	$2\frac{1}{2}$	1	$1\frac{1}{4}$	30	**12/2**
23	$10\frac{1}{4}$	$3\frac{3}{4}$	$1\frac{5}{8}$	$1\frac{1}{8}$	1	28	**12/–**
24	$10\frac{1}{4}$	$4\frac{3}{4}$	2	$1\frac{1}{8}$	$1\frac{1}{4}$	32	**13/6**
25	$10\frac{1}{4}$	$5\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{2}$	41	**16/6**

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ELECTRIC BATTERIES AND LAMPS.

Fig. 4000.

LECLANCHE CELLS. **Porous Pot Type.**

	Complete with sal ammoniac	Porous pots	Zinc rods	Glass jars.
3 pint ...	**5/10** each	**2/9** each	1/– each	**2/8** each
2 pint ...	**4/2** ,,	**2/–** ,,	**9d.** ,,	**1/6** ,,

Fig. 4001. ELECTRIC BELL WIRE.

		Price per 110 yds.
22 B.W.G.	Copper wire, double cotton covered and paraffined	**5/–**
20 ,,	,, ,, ,, ,, ,, ...	**6/6**
22 B.W.G.	Tinned copper wire, rubber covered, double cotton covered and paraffined ...	**6/6**
20 ,,	,, ,, ,, ,, ,, ,, ,, ...	**8/–**
2/20 B.W.G.	Twin ,, ,, ,, ,, ,, ,, ,, ...	**18/6**

Fig. 4003.
DRY CELLS.

1–5 volts.
$6\frac{1}{2}'' \times 2\frac{1}{2}''$

PRICE :
4/– each.
Best quality.

Fig. 4002.
INSULATING SADDLE STAPLES.

To prevent cutting insulation of wire, the arch of staple is protected by vulcanised fibre.

			Per 100	Per 1000
B 521	$\frac{1}{2}''$ long to take approximately $\frac{3}{16}''$ diameter ...		**4/–**	**30/–**
B 522	$\frac{3}{4}''$,, ,, ,, $\frac{3}{16}''$,, ...		**4/6**	**36/–**
B 523	$\frac{5}{8}''$,, ,, ,, $\frac{1}{4}''$,, ...		**5/–**	**40/–**
B 524	$\frac{7}{8}''$,, ,, ,, $\frac{1}{4}''$,, ...		**5/6**	**46/–**

Fig. 4004. OSRAM GAS-FILLED LAMPS. 100 to 260 Volts.

Standard voltages	Watts	Type of cap	Approx. current consumption	Price each
100, 105, 110,	30	B.C.	1 unit in 33 hours	**2/6**
115, 120, 125,	40	B.C.	,, 25 ,,	**2/6**
130	60	B.C.	,, 17 ,,	**3/–**
	75	B.C.		**4/–**
	100	B.C.	,, 10 ,,	**5/–**
	150	E.S.	,, $6^2/_3$,,	**7/–**
	200	E.S.	,, 5 ,,	**9/–**
	300	G.E.S.	,, $3^1/_3$,,	**12/–**
	500	G.E.S.	,, 2 ,,	**15/–**
	1000	G.E.S.	,, 1 ,,	**20/–**
	1500	G.E.S.	,, 40 mins.	**27/6**
200, 205, 210,	40	B.C.	1 unit in 25 hours	**3/–**
220, 225, 230,	60	B.C.	,, 17 ,,	**3/–**
240, 250, 260	75	B.C.		**4/–**
	100	B.C.	,, 10 ,,	**5/–**
	150	E.S.	,, $6^2/_3$,,	**7/–**
	200	E.S.	,, 5 ,,	**9/–**
	300	G.E.S.	,, $3^1/_3$,,	**12/–**
	500	G.E.S.	,, 2 ,,	**15/–**
	1000	G.E.S.	,, 1 ,,	**20/–**
	1500	G.E.S.	,, 40 mins.	**27/–**

Osram (Gasfilled) Lamp.

OSRAM VACUUM LAMPS. 100 to 260 Volts.

Standard voltages	Watts	Approx. British C.P.	Approx. current consumption	Price each Pear shape
100, 105, 110,	10	8	1 unit in 100 hours	**2/2**
115, 120, 125,	20	16	,, 50 ,,	**2/2**
130	30	25	,, 33 ,,	**2/2**
	40	35	,, 25 ,,	**2/2**
	60	55	,, 17 ,,	**2/2**
200, 205, 210,	20	15	1 unit in 50 hours	**2/9**
220, 225, 230,	30	23	,, 33 ,,	**2/6**
240, 250, 260	40	33	,, 25 ,,	**2/6**
	60	52	,, 17 ,,	**2/6**

Osram (Vacuum) Lamp.

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ELECTRIC BELLS, Etc.

Fig. 4005. Standard Quality Wood Pushes.
In walnut or oak.

Size, inches	$2\frac{1}{2}$	3
Price per doz. ...	**30/–**	**40/–**

Fig. 4006. Bell Switches.
Walnut base. $2\frac{1}{2}''$ diameter connections at rear.

	1 way	2 way	3 way
Per doz. ...	**32/–**	**38/–**	**45/–**

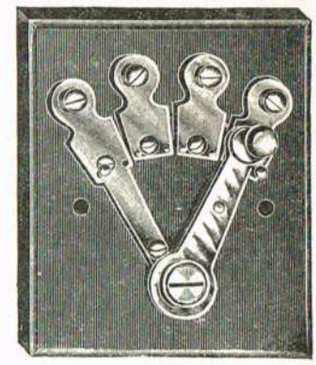

Fig. 4007. Bell Switch. 3 way.

1 way.	2 way.	3 way.
1/10	**2/-**	**2/6**

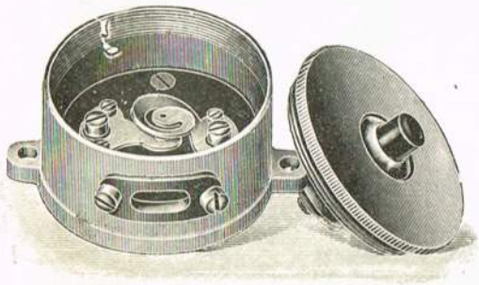

Fig. 4009. Water-tight Push.
Admiralty pattern. $2\frac{3}{4}''$ diameter.
Price ... **10/–** each.

Fig. 4008. Best Quality Brass Pushes
With ebonite backs.

Size, inches ...	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price each ...	**2/3**	**2/8**	**3/–**	**3/6**

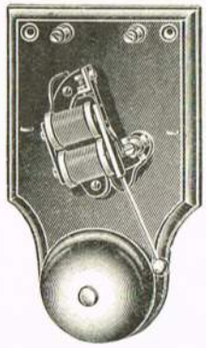

Fig. 4010.
Best quality polished hardwood case, heavy cast iron frame, gong pillar, brass terminals and screw caps, nickel-plated metal gong, enamelled copper wire.

Size of gong.	Round gong.	Sheep gong.
3″ ...	**13/–**	**16/6** each.
$3\frac{1}{2}''$ ...	**15/–**	**18/6** ,,
4″ ...	**17/–**	**20/6** ,,

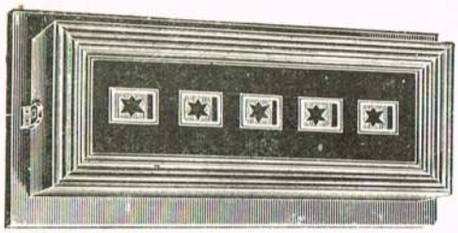

Fig. 4011. Best quality polished solid walnut case, brass terminal plates, wired with insulated copper wire, long swing type pendulum movement, brass frame, bobbins wound with enamelled copper wire, black and gold glass front.

	2-hole	3-hole	4-hole	5-hole	6-hole
Price each	**32/–**	**39/–**	**48/–**	**52/–**	**57/–**

8-hole and up ... **9/6** per hole.

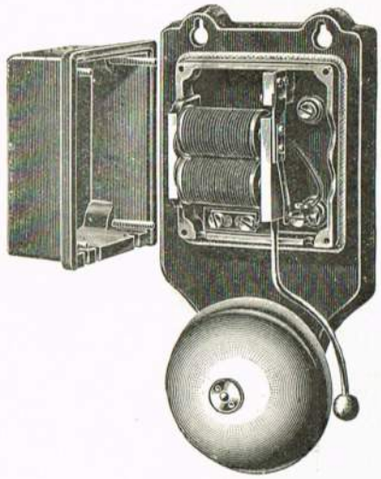

Fig. 4013.
Waterproof, iron case, electric bell for battery or connecting to lighting circuits.

For Battery.

Size, inches	4	5	6	8	10
Price each ...	**45/–**	**48/–**	**54/–**	**90/–**	**140/–**

For 100 v. D.C.

Size, inches ...	6	8
Price each ...	**68/–**	**116/–**

For 200 V. D.C.

Size, inches ...	6	8
Price each ...	**75/–**	**126/–**

Fig. 4012.
Hardwood case, iron frame, nickel-plated terminals, nickel-plated gong. 3″ diam.

Round gong ...	**7/–**	each
Sheel gong ...	**8/–**	,,

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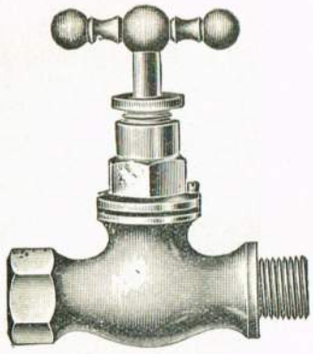
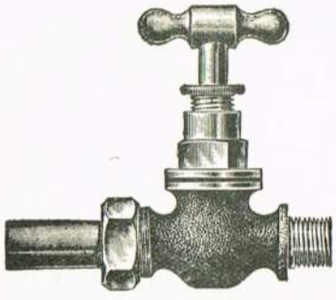
COCKS.



Stop Cocks for Iron.

Fig. 4020. M. & M., F. & F., M. & F. Stopcocks.

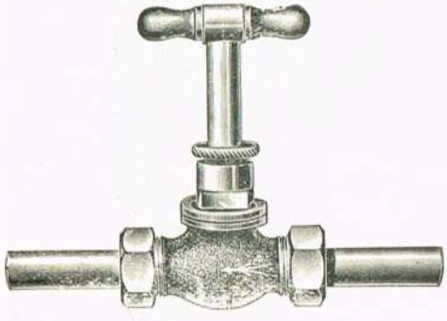
	Light.		Medium.		N.R. Pattern.		
Size, inches	⅜ Doz.	½ Doz.	¾ Doz.	1 Doz.	1¼ Each	1½ Each	2 Each
Light, price ...	—	48/–	68/–	108/–	18/–	24/–	48/–
Medium, price	—	60/–	87/–	132/–	—	—	—
Heavy, price ...	63/–	66/–	108/–	156/–	30/–	42/–	80/–



Stop Cocks, Male and Union.

Fig. 4021. Male and Union Stop Cocks.

	Medium.		New River Weight.			
Size, inches	½ Doz.	¾ Doz.	1 Doz.	1¼ Each	1½ Each	2 Each
Medium, price ...	66/–	96/–	132/–	22/–	30/-	54/–
Heavy, price ...	84/–	132/–	180/–	—	—	—



Stop Cocks, Double Union.

Fig. 4022. Double Union Stop Cocks.

	Light.		Medium.			Heavy.	
Size, inches	⅜ Doz.	½ Doz.	¾ Doz.	1 Doz.	1¼ Each	1½ Each	2 Each
Light, price ...	—	72/–	96/–	172/–	27/–	37/–	56/–
Medium, price	—	87/–	—	—	—	—	—
Heavy, price ...	87/–	90/–	144/–	200/–	39/–	53/-	130/–

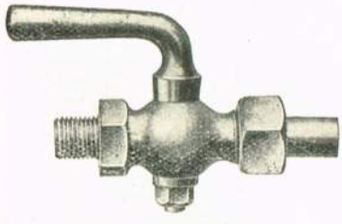


Fig. 4023. Gun-metal Drain Cock.

Size, inches	¼	⅜	½
Price each	4/6	5/–	8/–

Fig. 4024. Gun-metal Pet Cock.

Size, inches	¼	⅜	½
Price each	3/6	4/–	5/6

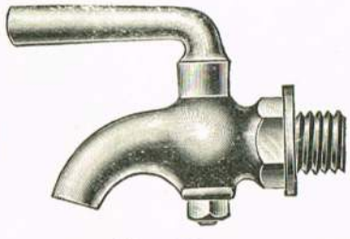


Fig. 4025. Gun-metal Pet Cock.

Size, inches	⅛	¼	⅜	½
Price each	3/6	4/–	4/6	6/–

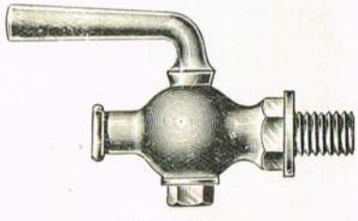


Fig. 4026. Gun-metal Air Cock.

Size, inches	⅛	¼	⅜	½
Price each	3/6	4/–	4/6	5/6

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COCKS.

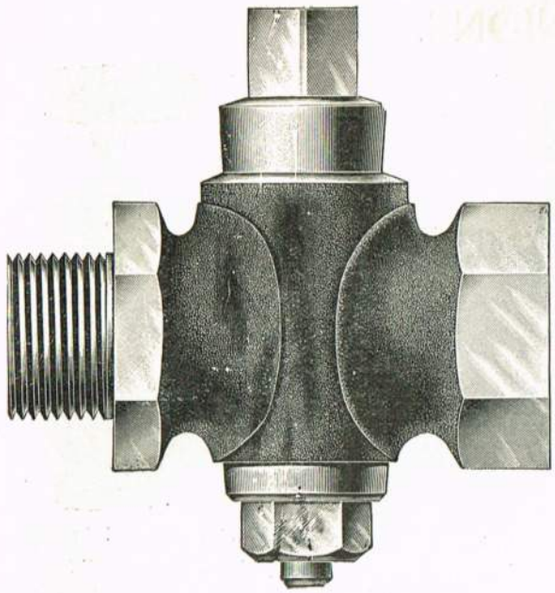

Fig. 4027.

M. & F. HEAVY GUN-METAL STEAM PLUG COCKS.

With long tapered plugs.

Size	Weight lbs.	ozs.	Price each	Malleable iron keys to suit.
¼		6	3/9	–/3
⅜		10	4/6	–/3
½		15	5/6	–/4
¾	1	8	7/6	–/5
1	2	4	10/–	–/5
1¼	3	12	17/–	–/7
1½	5	0	21/–	–/10
2	8	12	30/–	1/–
2½	16	0	70/–	1/6
3	20	0	80/–	2/–

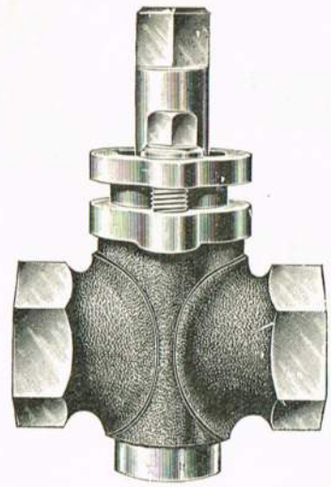

Fig. 4028.

HEAVY GUN-METAL STEAM GLAND COCKS.

With strong bolted cross gland.

Size	Weight lbs.	ozs.	Price each	Keys each
½	1	3	8/–	–/4
¾	1	14	11/–	–/5
1	2	12	15/–	–/5
1¼	4	8	22/–	–/7
1½	6	4	30/–	–/10
2	11	8	50/–	1/–

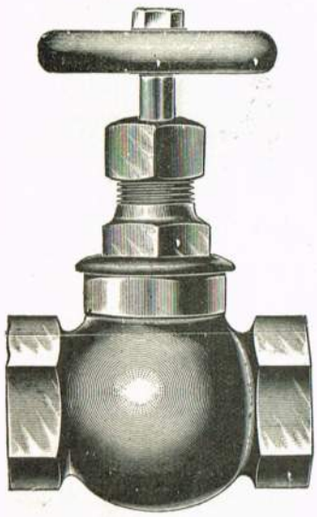

Fig. 4029.

HEAVY GUN-METAL GLOBE VALVES.

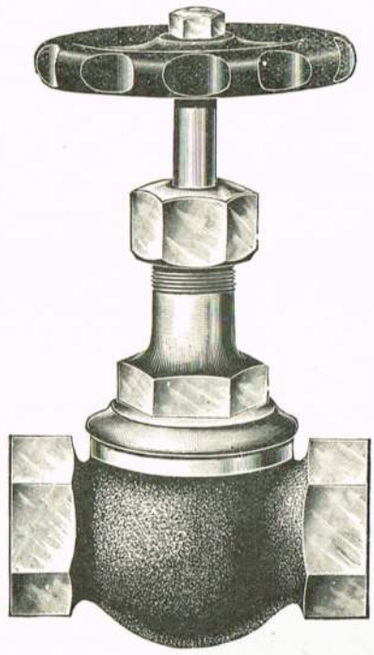

Fig. 4030.

RENEWABLE DISC VALVE.

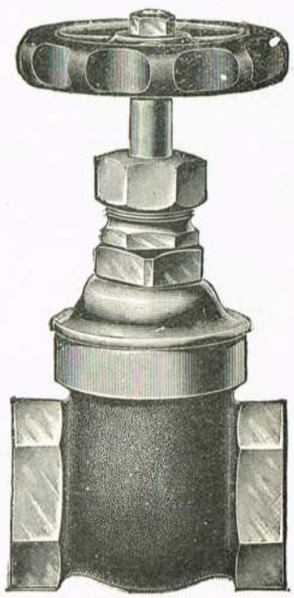

Fig. 4031.

HEAVY GUN-METAL FULLWAY GATE VALVE.

		With iron wheel. Size, inches...	¼	⅜	½	¾	1	1¼	Solid wedge. 1½	2	Iron wheel. 2½	3
Fig. 4029	Each		4/6	4/9	5/6	8/–	11/6	16/–	20/–	30/–	55/–	90/–
Fig. 4030	Each		6/–	6/6	7/6	10/–	12/6	20/–	25/–	42/–	—	—
Fig. 4031	Each		—	—	7/–	9/–	12/–	16/–	20/–	27/–	60/–	80/–

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VALVES & UNIONS.

Fig. 4032.
Gun-Metal Radiator Valve.

Size, ins.	½	¾	1	1¼
Price, each	6/6	8/-	9/6	12/-

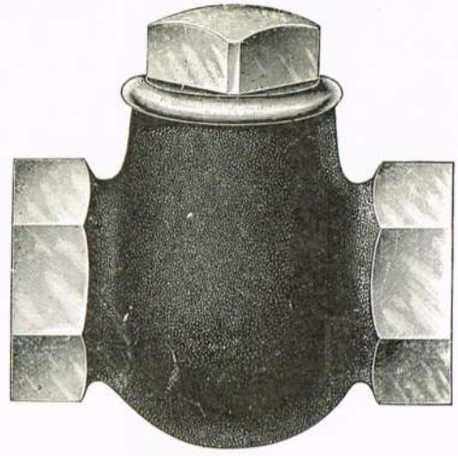

Fig. 4033. Gun-Metal Check Valve.

Size, ins. ...	⅜	½	¾	1	1¼	1½	2
Price, each ...	3/6	4/-	5/-	7/6	12/-	15/-	22/-

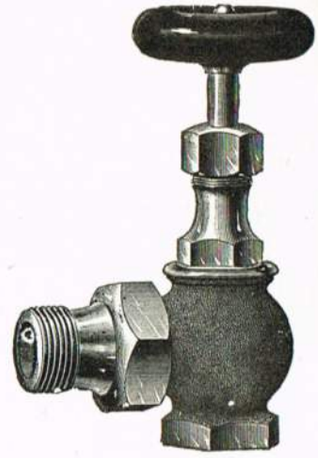

Fig. 4034. Gun-Metal Radiator Valve with Union.

Size, ins.	½	¾	1	1¼
Price, each	7/6	9/-	10/6	14/-

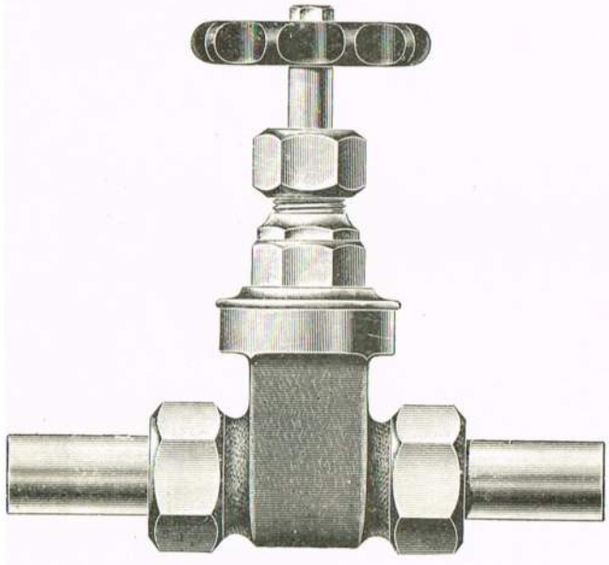

Fig. 4035. Full-way Heavy Gun-Metal Gate Valves.
Iron Wheels.

Size, inches	½	½	1	1¼	1½	2
With female and Union, each	9/-	11/6	16/-	21/-	27/-	40/-
With Union each end, each	12/6	15/-	25/-	30/-	35/-	50/-

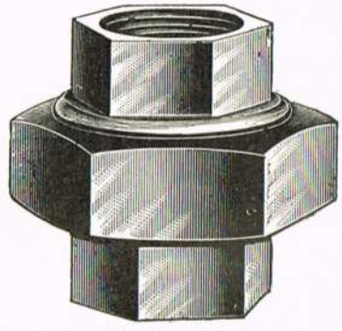

Fig. 4036. Gun-Metal Steam Union Ground-in Joint.

Size, ins. ...	¼	⅜	½	¾	1	1¼	1½	2
Price, each ...	2/-	3/-	3/6	4/-	6/-	9/-	12/-	18/-

Fig. 4038. Heavy Gun-Metal Radiator Union Elbow.

Size, ins.	½	¾	1	1¼	1½
Price, each	2/6	3/-	4/-	6/6	9/-

Fig. 4037. Male Head to Iron.

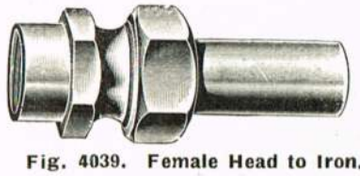

Fig. 4039. Female Head to Iron.

PLUMBERS' UNIONS,

Size, inches	⅜	½	¾	1	1¼	1½	2
Light Plumbers' Union, male, doz.	—	17/6	27/-	37/-	56/-	80/-	132/-
Heavy Plumbers' Union male, doz.	18/-	19/6	30/-	40/-	—	—	—
Heavy Plumbers' Union female, doz. ...	—	20/-	28/-	42/-	60/-	84/-	144/-

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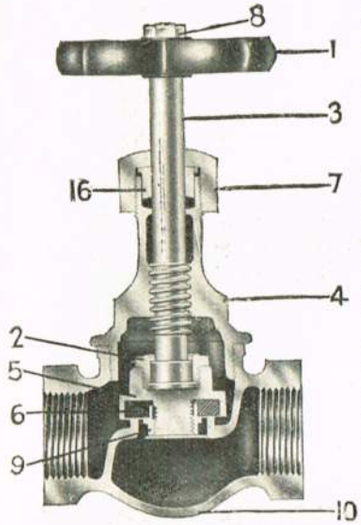
JENKIN'S VALVES.

Fig. 4040. RENEWABLE DISC VALVES.

Jenkins' Valves are designed and guaranteed for a working steam pressure of 150 lbs. or water pressure of 250 lbs., and are manufactured of special high-grade steam metal. Fitted with Jenkins' disc removing nut and nut-lock. Metal gland in stuffing-box. Unless otherwise ordered, valves are always furnished with steam pressure discs. Valves for cold water, air or gas pressure should be fitted with discs slightly softer than for steam. Always specify for what purpose they are required when ordering, giving pressure.



Figs. 106 to 109, in section. Standard pattern.

NOTE.—Fig. 106 (illustrated). Standard screwed valve.
Fig. 108. Same as No. 106, screwed, but angle pattern.
Fig. 107. Same type as No. 106, but for flanged pipes.
Fig. 109. Same as No. 107, for flanged pipes, but angle pattern.

Size of pipes, inches	1/8	1/4	3/8	1/2	3/4	1
Price each, Figs. 106 and 108	**4/7**	**4/7**	**5/3**	**6/8**	**9/2**	**11/8**
Weight, lbs.	11/16	3/4	1	1 1/2	2 1/8	3 5/16
Diam. face to face, inches	9/16	2 1/8	2 3/8	2 3/4	3 9/16	3 13/16
Price each, Figs. 107 and 109	—	**14/7**	**16/8**	**16/8**	**20/10**	**25/–**
Weight, lbs.	—	1 11/16	1 13/16	2 13/16	4 1/8	5 13/16
Diam. face to face, inches	—	2 1/2	3	3 1/16	3 5/8	4

Size pipes, inches....	1 1/4	1 1/2	2	2 1/4	3
Price each, Figs. 106 and 108	**16/8**	**23/–**	**36/6**	**65/8**	**91/8**
Weight, lbs.	4 7/8	6 3/4	11	16 5/16	25 1/2
Diam. face to face, inches	4 1/4	4 7/8	5 3/4	6 5/8	8 1/8
Price each, Figs. 107 and 109	**37/6**	**45/10**	**68/9**	**104/2**	**141/8**
Weight, lbs.	8 9/16	11 1/8	19 7/16	28 1/4	37 1/2
Diam. face to face, inches	4 3/8	4 7/8	6	6 3/4	7 1/2

Description of spare parts, as shewn in sectional illustration:
1, Wheel; 2, Lock nut; 3, Spindle; 4, Bonnet; 5, Disc holder; 6, Disc; 7, Waste nut; 8, Wheel nut; 9, Disc nut; 10, Body; 16, Follower.

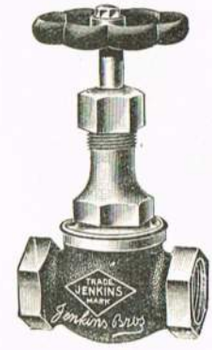


Fig. 106.

Fig. 4041. "RELIANCE" PATTERN BRONZE GLOBE VALVES. Regrinding Type.

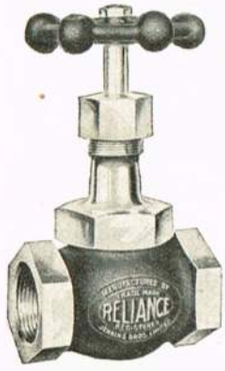


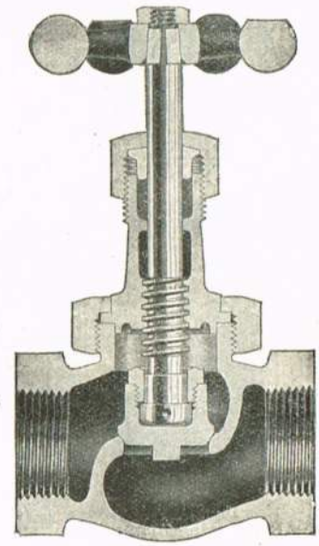
Fig. 425.

Valves are suitable for a working steam pressure of 200 lbs., or water pressure of 300 lbs. Every valve is manufactured throughout with best naval bronze, and carefully tested.

NOTE.—Fig. 425 (illustrated). Screwed valve.
Fig. 427. Same as No. 425, screwed, but angle pattern.
Fig. 426. Same as No. 425, but for flanged pipes.
Fig. 428. Same as No. 426, for flanged pipes, but angle pattern.

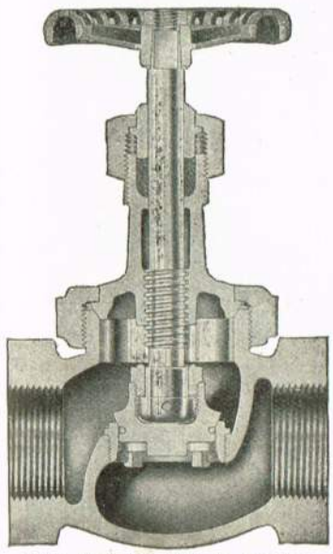
Size pipes, inches....	1/8	1/4	3/8	1/2	3/4	1
Price each, Figs. 425 and 427	**5/5**	**5/5**	**6/3**	**7/11**	**10/5**	**14/7**
Weight, lbs.	—	13/16	13/16	1 3/8	2 1/8	3 1/16
Face to face, inches	—	2 1/8	2 1/8	2 3/8	3	3 3/8
Price each, Figs. 426 and 428	—	—	—	**20/10**	**25/–**	**33/4**
Diam. face to face, inches	—	—	—	3 5/8	4 1/8	4 5/8
Diam. of flange, inches	—	—	—	3	3 1/2	4

Size pipe, inches	1 1/4	1 1/2	2	2 1/2	3
Price each, Figs. 425 and 427	**20/10**	**29/2**	**45/10**	**83/4**	**120/10**
Weight, lbs.	4 1/2	5 15/16	10	14 1/2	25
Face to face, inches	3 7/8	4 3/8	5 3/8	6 1/2	7 1/4
Price each, Figs. 426 and 428	**45/10**	**58/4**	**83/4**	**137/6**	**200/–**
Diam. face to face, inches	4 7/8	5 7/8	6 7/8	7 3/4	8 1/2
Diam. of flange, inches	4 1/2	5	6	7	7 1/2



Figs. 425 to 428, in section.

Fig. 4042. "STERLING" PATTERN HARD BRONZE HEAVY REGRINDING TYPE.



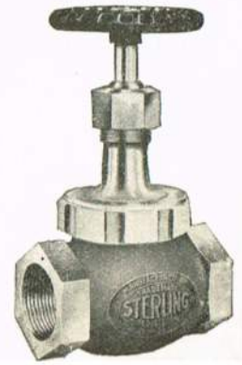
Figs. 500 to 503, in section.

Suitable for a working steam pressure of 300 lbs., or water pressure of 800 lbs.
The renewable seat is a special feature of the "Sterling" Valve.

NOTE.—Fig. 500 (illustrated). Screwed valve.
Fig. 502. Same as No. 500, screwed, but angle pattern.
Fig. 501. Same as No. 500, but for flanged pipes.
Fig. 503. Same as No. 501, for flanged pipes, but angle pattern.

Size pipe, inches	1/4	3/8	1/2	3/4	1
Price each, Figs. 500 and 502	**12/6**	**14/7**	**16/8**	**20/10**	**27/1**
Weight, lbs.	1 1/2	1 1/2	2	3 1/16	4 1/2
Face to face, inches	2 1/4	2 1/2	2 3/4	3 1/4	3 3/4
Price each, Figs. 501 and 503....	—	—	**25/–**	**31/3**	**41/8**
Diam. face to face, inches	—	—	4	4 1/2	4 3/4
Diam. flanges, inches	—	—	3 1/2	4	4 1/2

Size pipe, inches	1 1/4	1 1/2	2	2 1/2	3
Price each, Figs. 500 and 502....	**34/5**	**45/10**	**66/8**	**137/6**	**187/6**
Weight, lbs.	6 13/16	9 5/8	16 1/2	25 1/2	37
Face to face, inches	4 3/8	5	6 1/8	7 1/4	8 3/4
Price each, Figs. 501 and 503....	**54/2**	**70/10**	**100/–**	**179/2**	**237/6**
Diam. face to face. inches	5 1/4	6 1/2	7 1/4	8 1/4	9 1/4
Diam. flanges, inches	5	6	6 1/4	7 1/4	8 1/4



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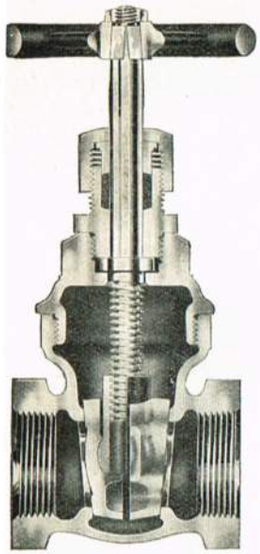
JENKIN'S VALVES.



Figs. 300 to 301, in section.

Fig. 4043. Type K STANDARD PATTERN BRASS GATE VALVE.

Constructed on new principles. The valve body has guides to prevent the discs coming in contact with the seats until completely closed. The discs cannot jamb in the body. Suitable for 125 lbs. working steam pressure, or water pressure 175 lbs. Tested to 300 lbs. water.

Note.—Fig. 300 (illustrated), screwed valve.
Fig. 301, same as No. 300, but for flanged pipes.

Size pipe, inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Fig. 300, Price each	**6/–**	**6/–**	**7/–**	**8/6**	**11/9**	**15/6**	**20/10**	**30/6**	**57/3**	**79/3**
Weight, lbs.	3/4	3/4	1 3/16	1 11/16	2 9/16	3 15/16	5 5/8	8	14 1/2	22 3/4
Diam. face to face, inches	1 15/16	1 15/16	2 3/16	2 3/8	2 3/4	3 1/8	3 9/16	4 3/16	5	5 9/16
Fig. 301, Price each	**36/–**	**36/–**	**36/6**	**37/6**	**42/9**	**50/–**	**62/6**	**104/3**	**137/6**	**162/6**
Weight, lbs.	1 9/16	2 1/16	2 7/16	3 11/16	5 9/16	7 3/8	10 3/4	17 3/4	21 1/4	31
Diam. face to face, inches	2 3/8	2 3/8	2 5/8	3	3 3/8	3 13/16	4 1/4	5 3/8	6 1/4	7
Diam. of face, inches	3	3	3	3 1/2	4	4 1/2	5	6	7	7 1/2

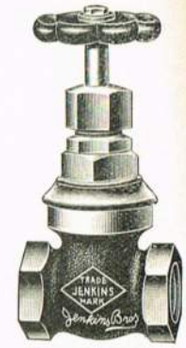


Fig. 300.

RADIATOR VALVES.

Fig. 4044. Type K. STANDARD PATTERN RADIATOR GATE VALVES.

Manufactured on the same principle as those above listed, with the same degree of accuracy.
Note.—The illustration represents Fig. 308, with screwed union.

I. 24. Radiator Valve. Type K.

Screwed Ends.

No.	Sizes pipes, inches	1/2	3/4	1	1 1/4	1 1/2	2
1	Rough body, finished trimmings	**8/4**	**10/8**	**14/2**	**18/9**	**25/–**	**37/1**
2	Finished all over	**13/9**	**16/8**	**21/3**	**28/2**	**37/6**	**57/11**
3	Rough body, plated trimmings	**9/2**	**11/8**	**15/3**	**19/10**	**26/1**	**38/9**
4	Rough body, plated all over	**10/–**	**12/6**	**16/1**	**20/10**	**27/6**	**40/3**
5	Finished and plated all over	**15/5**	**18/9**	**23/4**	**30/8**	**40/5**	**61/8**

With Male or Female Unions.

No.	Sizes pipes, inches	1/2	3/4	1	1 1/4	1 1/2	2
6	Rough body, finished trimmings	**13/4**	**15/8**	**19/5**	**25/–**	**34/5**	**49/7**
7	Finished all over	**18/7**	**21/11**	**26/6**	**34/5**	**46/11**	**70/5**
8	Rough body, plated trimmings	**14/2**	**16/8**	**20/5**	**26/3**	**36/1**	**51/3**
9	Rough body, plated all over	**15/3**	**17/9**	**21/8**	**27/6**	**37/6**	**53/4**
10	Finished and plated all over	**20/5**	**24/–**	**29/2**	**37/6**	**50/–**	**74/7**

Fig. 4045. STANDARD PATTERN RADIATOR RENEWABLE DISC RADIATOR VALVES.

Note.—Fig. 167. Horizontal pattern with male and female unions (when ordering, please specify male or female union).
Fig. 168. Angle pattern (illustrated), with male or female unions.
Fig. 165. Horizontal pattern, screwed for pipes.
Fig. 166. Angle pattern, screwed for pipes.

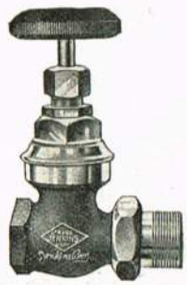


Fig. 168. Angle Male Union.

Prices of Fig. 167 and 168. With Male or Female Unions.

No.	Sizes pipes, inches	3/8	1/2	3/4	1	1 1/4	1 1/2	2
6	Rough body, finished trimmings	**10/10**	**11/6**	**14/7**	**17/11**	**24/5**	**32/4**	**52/6**
6	Rough body, finished trimmings, (light pattern)	—	—	—	—	—	—	—
7	Finished all over	**12/6**	**13/4**	**16/8**	**20/–**	**26/8**	**36/6**	**57/9**
8	Rough body, nickel plated trimmings	**12/1**	**12/9**	**15/10**	**19/2**	**25/8**	**33/7**	**53/9**
9	Rough body, nickel plated all over	**12/6**	**13/2**	**16/3**	**19/7**	**26/1**	**34/–**	**54/2**
10	Finished and nickel plated all over	**14/5**	**15/–**	**18/4**	**21/8**	**28/4**	**38/2**	**59/5**

Prices of Screwed Ends, Right or Left-Hand Threads.

No.	Sizes pipes, inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
1	Rough body, finished trimmings	**6/3**	**7/9**	**8/4**	**10/5**	**13/4**	**18/9**	**26/1**	**43/9**
2	Finished all over	**8/4**	**9/5**	**10/5**	**12/6**	**15/8**	**21/11**	**30/3**	**49/0**
3	Rough body, nickel plated trimmings	**7/6**	**9/–**	**9/7**	**11/8**	**14/7**	**20/–**	**27/4**	**45/–**
4	Rough body, nickel plated all over	**7/11**	**9/5**	**10/–**	**12/1**	**15/–**	**20/5**	**27/9**	**45/5**
5	Finished and nickel plated all over	**10/–**	**11/3**	**12/1**	**14/2**	**17/4**	**23/7**	**31/11**	**50/8**

Fig. 4046. JENKIN'S "RELIANCE" BRONZE REGRINDING SWING CHECK VALVES.

Fig. 449 (illustrated), screwed for pipes.
Fig. 450, same as No. 449, but for flanged pipes.

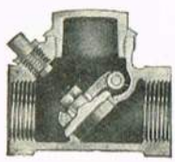


Fig. 449.

Sizes pipe, inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Fig. 449, Price each	**10/5**	**10/5**	**11/6**	**12/11**	**16/8**	**22/11**	**29/2**	**41/8**	**79/2**	**112/6**
Fig. 450, Price each	—	—	**37/6**	**41/8**	**52/1**	**70/10**	**87/6**	**145/10**	**208/4**	**270/10**

Fig. 4047. BRASS SWING CHECK VALVE. Type K.

Fig. 475 (illustrated), screwed for pipes.
Fig. 476, same as No. 475, but for flanged pipes.

Sizes pipe, inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Fig. 475, Price each	**5/6**	**5/6**	**6/3**	**7/6**	**9/6**	**13/6**	**17/9**	**26/–**	**50/–**	**83/6**
Fig. 476, Price each	—	—	—	**17/9**	**26/1**	**32/9**	**42/9**	**64/7**	**104/2**	**135/5**

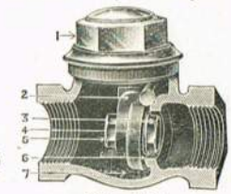


Fig. 475.

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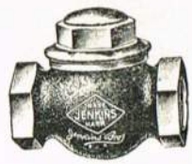
JENKIN'S VALVES.

Fig. 4048. JENKIN'S BRASS CHECK VALVES.

Renewable Disc. Standard Pattern.

Note.—Fig. 117 (illustrated), represents horizontal screwed valve.
Fig. 120, same as No. 117, but for flanged pipes.
Fig. 118 (illustrated) represents angle screwed valve.
Fig. 120A, same as No. 118, but for flanged pipes.
Fig. 119 (illustrated) represents vertical screwed valve.
Fig. 120B, same as No. 117, but for flanged pipes.



Horizontal, Screwed.
Fig. 117.

Angle, Screwed.
Fig. 118.

Vertical Screwed.
Fig. 119.

Prices for Figs. 117, 118, 119.

Size pipe, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price each	**4/7**	**4/7**	**5/–**	**5/5**	**7/11**	**10/10**	**15/–**	**20/10**	**31/3**	**58/4**	**87/6**

Prices for Figs. 120, 120A, 120B.

Sizes pipes, inches	⅜	½	¾	1	1¼	1½	2	2½	3
Price each	**16/9**	**16/9**	**21/–**	**25/–**	**33/6**	**41/9**	**62/6**	**96/–**	**133/6**

"Reliance"
Horizontal Check,
Screwed, Fig. 443.
Tested steam, 200lbs.
Tested water, 325lbs.

"Sterling"
Screwed, Fig. 518.
Heavy pattern.
Tested steam, 300lbs.
Tested water, 800lbs.

Fig. 4049. JENKIN'S "RELIANCE" AND Fig. 4049A. "STERLING" BRONZE REGRINDING CHECK VALVES.

PRICES.

Size pipe, ins.	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Fig. 443	**4/10**	**4/10**	**5/8**	**7/1**	**9/5**	**13/2**	**18/9**	**26/3**	**41/3**	**75/–**	**108/4**
Fig. 444	—	—	—	**16/8**	**20/10**	**29/2**	**41/8**	**54/2**	**75/–**	**125/–**	**179/2**
Fig. 518	—	**10/5**	**10/5**	**12/6**	**14/7**	**18/9**	**22/11**	**32/4**	**47/11**	**87/6**	**125/–**
Fig. 519	—	—	—	**20/10**	**27/1**	**35/5**	**43/9**	**59/5**	**83/4**	**129/2**	**175/–**

Note.—Fig. 443 (illustrated) represents screwed pattern.
No. 444, same as No. 443, but for flanged pipes.
Fig. 518 (illustrated) represents screwed pattern.
Fig. 519, same as No. 518, but for flanged pipes.

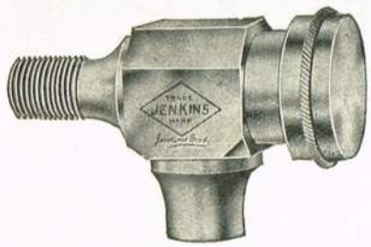


Fig. 190.

Fig. 4050. JENKIN'S IMPROVED AUTOMATIC AIR VALVES.

Suitable for high or low pressure. Fitted with renewable composition plug. Simple yet practicable.

Fig. 190. ⅛″ pipe, nickel plated, **31/3** doz. Fig. 190, ¼″ pipe, nickel plated, **31/3** doz.
Fig. 191. Drip cup, **8/4** doz.
Fig. 193. ⅛″ pipe fitted with ⅛″ brass union for connecting drip pipe, **39/7** doz.
Fig. 193. ⅛″ ,, ,, ¼″ ,, ,, ,, ,, ,, **41/8** doz.
Fig. 193. ¼″ ,, ,, ¼″ ,, ,, ,, ,, ,, **41/8** doz.

Fig. 4051. JENKIN'S STANDARD PATTERN IRON BODY GLOBE VALVES.

With yoke. Composition mounted. Screwed. Angle and flanged. Patterns suitable for 150 lbs. working steam pressure, or 250 lbs. working water pressure.

Fig. 141 (illustrated), screwed for pipes. Fig. 143 same as No. 141, but angle pattern.
Fig. 142, same as No. 141 for flanged pipe. Fig. 144, same as No. 142, but angle pattern.

Sizes pipes, inches	2	2½	3	3½	4	4½	5	6
Figs. 141 and 143. Price each	**41/9**	**50/–**	**69/9**	**81/3**	**100/–**	**133/6**	**166/9**	**200/–**
Diam. face to face, inches	6½	7¾	9⅜	10	12	12⅝	13¼	16
Diam. centre to face in angle pattern, inches	3⅞	4½	4⅝	5⅜	5⅞	6¼	6½	8
Figs. 142 and 144. Price each	**49/–**	**58/6**	**77/–**	**89/6**	**108/6**	**142/–**	**175/–**	**208/6**
Diam. face to face, inches	7⅛	7½	9¼	10	11¾	12½	13⅛	16
Diam. centre to face, angle pattern, inches	3⅞	4½	4⅝	5⅜	5⅞	6¼	6½	8
Diam. of flanges, inches	6	7	7½	8½	9	9¼	10	11
Diam. of hand wheel	5½	6½	7½	8	8¾	9¼	10	12

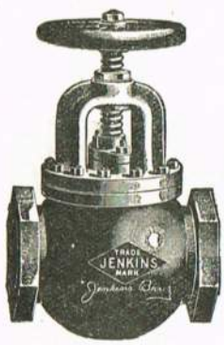


Fig. 141.

Fig. 4052. IRON BODY CHECK VALVES. Standard Pattern.

Horizontal, Angle and Vertical Types.
Fig. 153 (illustrated). Horizontal flanged. Fig. 153A. Same as No. 153. Angle flanged.
Fig. 153B. Vertical flanged.

Fig. 153.

Prices of Figs. 153, 153A, 153B.

Sizes pipe, inches	2	2½	3	3½	4
Flanged	**£2 1 8**	**£2 14 3**	**£3 8 9**	**£4 3 6**	**£4 16 0**
Screwed	**£1 13 4**	**£2 5 10**	**£2 18 4**	**£3 10 10**	**£4 3 4**

Sizes pipe, inches	4½	5	6	7	8
Flanged	**£5 16 9**	**£6 17 6**	**£8 19 0**	**£13 10 10**	**£16 13 4**
Screwed	**£5 4 2**	**£6 5 0**	**£8 6 8**	**£13 10 10**	**£16 13 4**

Fig. 4053. IRON BODY SWING CHECK VALVE.

Standard Pattern. Screwed or flanged.

Fig. 477 (illustrated) for flanged pipes. Fig. 478, same as Fig. 477, screwed for pipes.

Sizes pipes, inches	2½	3	3½	4	4½	5	6	7	8	10	12
Fig. 477. Price each	**60/5**	**70/10**	**87/6**	**100/–**	**125/–**	**141/8**	**170/10**	**250/–**	**312/6**	**479/2**	**700/–**
Diam. face to face, inches	8¾	9¾	10¾	11¾	—	13	15⅛	—	—	—	—
Diam. of flange	7	7½	8½	9	—	10	11	—	—	—	—
Fig. 478. Price each	**50/–**	**56/3**	**72/11**	**83/4**	**108/4**	**125/–**	**150/10**	**229/2**	**291/8**	**458/4**	**666/8**
Diam. face to face, inches	8	9	10	11¾	—	12 7/16	14¾	—	—	—	—

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JENKIN'S VALVES.

Fig. 4054. Type " K " Gate Valves.

Iron body, composition mounted.
Inside screw. Non-rising spindle.

2″ to 16″ suitable for 125 lbs. steam pressure ; 175 lbs water.

18″ to 30″ suitable for 100 lbs. steam pressure ; 125 lbs. water.

Screwed, Fig. 401. Flanged, Fig. 402.

PRICE EACH.

Fig.						
	Pipe sizes, ins.	2	2½	3	3½	4
401	Screwed	**42/–**	**48/–**	**58/6**	**71/–**	**79/6**
402	Flanged	**50/–**	**56/6**	**69/–**	**81/6**	**96/–**
	Pipe sizes, ins.	4½	5	6	7	
401	Screwed	**£5 0 0**	**£5 15 0**	**£6 15 6**	**£9 7 6**	
402	Flanged	**£5 17 0**	**£6 11 6**	**£7 12 0**	**£10 4 2**	
	Pipe sizes, ins.	8	9	10	12	
401	Screwed	**£11 5 0**	**£15 16 8**	**£18 15 0**	**£26 0 10**	
402	Flanged	**£12 1 8**	**£16 17 6**	**£19 15 10**	**£27 14 2**	
	Pipe sizes, ins.	14	15	16	18	
402	Flanged	**£37 14 2**	**£45 16 8**	**£54 3 4**	**£72 18 4**	
	Pipe sizes, ins.	20	22	24		
402	Flanged	**£88 10 10**	**£110 8 4**	**£125 0 0**		
	Pipe sizes, ins.	26	28	30		
402	Flanged	**£166 13 4**	**£197 18 4**	**£229 3 4**		

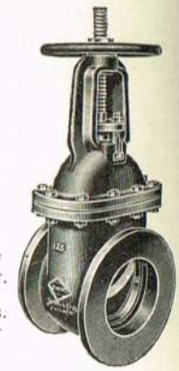
Fig. 4055.
Standard Gate Valves.
Type " K."

Iron body.
Composition mounted.

Outside screw and yoke, rising spindle.

2″ to 16″ suitable for 125 lbs steam pressure ; 175 lbs. water.

18″ to 30″ suitable for 100 lbs. steam pressnre ; 125 lbs. water



Screwed, Fig. 403. **With Bronze Spindles.** Flanged, Fig. 404

PRICE EACH.

Fig.						
	Pipe sizes, ins.	2	2½	3	3½	4
403	Screwed	**79/2**	**85/5**	**98/–**	**112/6**	**135/6**
404	Flanged	**87/6**	**94/–**	**108/6**	**123/–**	**152/–**
	Pipe sizes, ins.	4½	5	6	7	
403	Screwed	**166/8**	**187/6**	**216/8**	**287/6**	
404	Flanged	**183/6**	**204/6**	**233/6**	**304/2**	
	Pipe sizes, ins.	8	9	10	12	
403	Screwed	**£17 18 4**	**£23 10 10**	**£27 5 10**	**£35 16 8**	
404	Flanged	**£18 15 0**	**£24 11 8**	**£28 6 8**	**£37 10 0**	
	Pipe sizes, ins.	14	15	16	18	
404	Flanged	**£53 2 6**	**£64 11 8**	**£72 18 4**	**£97 18 4**	
	Pipe sizes, ins.	20	22	24		
404	Flanged	**£117 16 3**	**£145 16 8**	**£161 9 2**		
	Pipe sizes, ins.	26	28	30		
404	Flanged	**£213 10 10**	**£252 1 8**	**£291 13 4**		

With Steel Spindles.

	Pipe sizes, ins.	2	2½	3	3½	4
403	Screwed	**72/11**	**79/2**	**91/8**	**104/2**	**125/0**
404	Flanged	**81/3**	**87/6**	**102/1**	**114/7**	**141/8**
	Pipe sizes, ins.	4½	5	6	7	
403	Screwed	**154/2**	**175/–**	**200/–**	**266/8**	
404	Flanged	**170/10**	**191/8**	**216/8**	**283/4**	
	Pipe sizes, ins.	8	9	10	12	
403	Screwed	**£16 13 4**	**£21 17 6**	**£25 8 4**	**£33 6 8**	
404	Flanged	**£17 10 0**	**£22 18 4**	**£26 9 2**	**£35 0 0**	
	Pipe sizes, ins.	14	15	16	18	
404	Flanged	**£49 3 4**	**£59 7 6**	**£67 14 2**	**£90 12 6**	
	Pipe sizes, ins.	20	22	24		
404	Flanged	**£109 7 6**	**£135 8 4**	**£151 0 10**		
	Pipe sizes, ins.	26	28	30		
404	Flanged	**£197 18 4**	**£234 7 6**	**£270 16 8**		

Full dimensions of Figs. 401, 402, 403, and 404 on application.

Fig. 4056. DISCS FOR JENKIN'S VALVES.

They are manufactured of the finest grade of rubber and other materials, compounded and vulcanised with such accuracy as to produce practically a uniform product. The various compounds, each best suited for a particular kind of service. It will be noted that the hard discs will withstand the action of steam, acids, ammonia, oils, and the like, while the soft discs are made expressly for cold water, gas and air service.

New Style or Square Hole Disc Fig. 101.

Old Style, or Round Hole Disc Fig. 223

Schedule of the Principal Compounds and Services for which they are guaranteed.

Composition No. 119.

This is the regular steam disc which is used in all Jenkins Bros. Standard Globe, Angle, Cross, Y, Safety and Radiator Valves, when intended for **steam** service. Guaranteed for steam pressure up to 150 lbs.

Composition No. 110.

A tough, semi-hard disc, especially recommended for hot-water service. This is the composition regularly used in Jenkins Bros. Standard, Horizontal, Angle and Swing Check Valves, for boiler feed lines, returns, etc.

Composition No. 80.

An extremely hard disc, although possessing sufficient elasticity under pressure to insure perfect tightness. Guaranteed for steam pressures up to 100 lbs., and particularly desirable for use under pressures of oil, or in steam service which is likely to contain a percentage of oil.

Composition No. 93.

Rubber disc made expressly for cold water, gas or air service, and regularly supplied in all Jenkins Bros. Globe, Angle or Check Valve when intended for such service. This is a tough, pliable composition, suitable for hydraulic pressures up to 250 lbs.

Price List of Fig. 4056 Jenkins' Discs, with Dimensions, either pattern (specify which number when ordering).

Size	¼	⅜	½	¾	1	1¼	1½	1¾	2	2½	3	3½	4
Price"	**–/1½**	**–/2**	**–/2**	**–/2½**	**–/3**	**–/4½**	**–/6**	**–/9**	**–/9**	**1/–**	**1/8**	**2/1**	**2/6**
Diam., inches	$^{10}/_{16}$	$^{12}/_{16}$	$^{13}/_{16}$	$1^{1}/_{16}$	$1^{6}/_{16}$	$1^{10}/_{16}$	2	$2^{2}/_{16}$	$2^{9}/_{16}$	$3^{3}/_{16}$	$3^{15}/_{16}$	$4^{6}/_{16}$	$4^{27}/_{32}$
Size	4½	5	6	7	8	9	10	12	14	16	18	20	22
Price	**2/11**	**3/4**	**4/2**	**5/–**	**5/10**	**7/6**	**9/5**	**10/5**	**14/7**	**16/8**	**20/10**	**25/–**	**31/3**
Diam., inches	$5^{3}/_{16}$	$6^{1}/_{16}$	7	$8^{2}/_{16}$	$9^{5}/_{16}$	$10^{6}/_{16}$	$11^{7}/_{32}$	$13^{5}/_{32}$	$15^{13}/_{32}$	$17^{11}/_{16}$	$19^{10}/_{16}$	$21^{13}/_{16}$	24

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REDUCING VALVES.

Fig. 4060. The Mason Reducing Valve is a pressure regulator capable of maintaining a constant reduced pressure, irrespective of variations in the high pressure system or in the demand for low pressure steam.

Illustration of Standard Pattern.

THE CONSTRUCTION AND OPERATION OF THE MASON REDUCING VALVE is as follows :—

An auxiliary valve **11** admits high pressure steam from the inlet side through a port **N** to operate a piston **17**, which in turn opens the main valve **16**, and admits steam to the low-pressure system. This valve **11** is forced open by the compression of the large spiral spring **31** acting on the button **10**, through the diaphragm. As soon as the valve **11** is opened, steam passes through and into port **N** under piston **17**. By raising this piston **17** the main valve **16** is opened against the initial pressure, since the area of valve **16** is only one-half of that of piston **17**. Steam is thus admitted to the system. When the pressure in the system has reached the required point, the diaphragm is forced upward by the low-pressure steam, which passes up through port **X** to chamber **O**, under the diaphragm, allowing valve **11** to close, shutting off steam from piston **17**. The main valve **16** is now forced to its seat by the initial pressure, shutting off steam from the system, and pushing the piston **17** down to the bottom of its stroke. The steam beneath this piston **17** exhausts freely around it (the piston being fitted loosely for this purpose), and passes off into the system. It will be seen from this that when the pressure in low-pressure system has reached a predetermined point, the flow of steam will be automatically checked, and when the pressure is slightly reduced the valve will again open and supply the required amount of steam. The piston **17** is fitted with a dashpot **18**, which immediately filling with condensed steam prevents chattering or pounding.

DIRECTIONS FOR FIXING.—Place the valve vertically in the steam supply pipe. The steam should flow through the valve in the direction indicated by the arrow cast on the side. Before connecting the valve the pipes should be thoroughly blown out, in order to expel all dirt and chips. If the piping is new, steam should be allowed to flow through for some little time, so as to burn off all the oil and grease which may be in it.

When ready to let on steam, insert the key in the top of the spring case and screw down slowly. Time must be allowed for the system to fill before the required pressure is obtained. If the valve should not maintain a low pressure it will probably be due to the fact that some dirt or chips from the piping have lodged in the seat of the valve **16**.

TO TAKE THE VALVE APART, the tension or the diaphragm spring **8** must first be removed by turning the key. Then unscrew the spring case **30**, and remove the button **10**, and the diaphragm. Also remove the cap **22**, which contains the auxiliary valve. The threaded rod which accompanies each valve can then be screwed into the valve disc **16**, which should work easily. Pull out this valve and clean the seat. Then insert the rod through the valve-stem hole, screw it into the piston **17**, and see if it works up and down easily. It will not be found possible to raise and lower the piston **17** suddenly, as the dashpot **18** will restrain it. If the piston **17** is found to be stuck fast, remove the dashpot **18** at the bottom of the valve, pull out the piston and clean it with fine emery cloth being careful to wipe off all emery before replacing. Before replacing the cap **22**, examine the small auxiliary valve **11**, and see that it is tight and free from dirt. Be sure that the diaphragm **23** is perfectly clean, also that there is no dirt where it makes its seat.

In replacing the Diaphragm be sure that it goes in with the bead up, as shown in cut.

In ordering Repair Parts please use the Numbers.

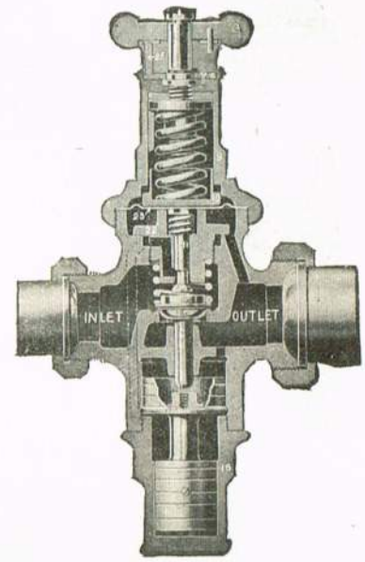

Illustration of Standard Pattern in section.

PRICE LIST.

ALL BRONZE. SCREWED UNION ENDS.

	½in. £ s. d.	¾in. £ s. d.	1in. £ s. d.	1¼in. £ s. d.	1½in. £ s. d.	2in. £ s. d.
Standard Reducing Valve	7 10 0	7 10 0	9 3 0	11 14 0	14 11 0	18 6 0
Ditto for pressures below 8lbs.	9 10 0	9 10 0	11 3 0	13 14 0	16 11 0	20 6 0

	¾×1½in. £ s. d.	1×2in. £ s. d.	1¼×2½in. £ s. d.	1½×3in. £ s. d.	2×4in. £ s. d.
			Outlet Flanged		
Differential Reducing Valve	9 3 0	11 14 0	14 11 0	18 6 0	23 15 0
Ditto for pressures below 8lbs.	11 3 0	13 14 0	16 11 0	20 6 0	25 15 0

IRON BODY. BRONZE MOUNTINGS. FLANGED ENDS.

	2½in. £ s. d.	3in. £ s. d.	3½in. £ s. d.	4ib. £ s. d.	5in. £ s. d.	6in. £ s. d.	8in. £ s. d.
Standard Reducing Valve	26 0 0	33 0 0	39 0 0	45 10 0	62 0 0	82 0 0	115 0 0
Ditto for pressures below 8lb.	28 0 0	35 0 0	41 0 0	47 10 0	64 0 0	84 0 0	117 0 0

	2½×5in. £ s. d.	3×6in. £ s. d.	3½×7in. £ s. d.	4×8in. £ s. d.	5×10in. £ s. d.	6×12in. £ s. d.
Differential Reducing Valve	33 0 0	39 0 0	45 10 0	62 0 0	82 0 0	115 0 0
Ditto for pressures below 8lbs.	35 0 0	41 0 0	47 10 0	64 0 0	84 0 0	117 0 0

DIMENSIONS AND WEIGHTS.

ALL BRONZE.

Standard Pattern.	Distance Centre to Top of Key.	Distance Centre to Bottom.	Length over Unions.	Weight lbs.	Differential Pattern.	Distance Centre to Top.	Distance Centre to Bottom.	Length Overall.	Inlet.	Distance of Outlet Flange.	Weight lbs.
½	7½	4¾	5¾	6	¾×1½	7¾	5	10¾	Union	Union	19
¾	7½	4¾	5¾	6	1 ×2	8¼	5½	10¾	,,	,,	28
1	10	5	7	11	1¼×2½	8½	6½	9¾	,,	7½	35½
1¼	11	6	8	16	1½×3	11½	8¾	10¼	,,	8¼	41
1½	11¾	7½	9	23	2 ×4	12½	10¾	10¼	,,	10	73
2	12	9⅛	11¼	42							

IRON BODY AND BRONZE MOUNTINGS.

Standard Pattern.	Diameter of Flanges.	Distance Centre to Top.	Distance Centre to Bottom.	Length over Flanges.	Weight lbs.	Differential Pattern.	Distance Centre to Top.	Distance Centre to Bottom.	Length Overall.	Diameter Inlet Flange.	Diameter Outlet Flange.	Weigh lbs.
2½	7½	12	9½	8¾	70	2½× 5	16	10½	9	7½	11	103
3	8¼	14	10½	10¼	109	3 × 6	16	12	11¼	8¼	12½	146
3½	9	14	11½	12	162	3½× 7	16	13½	12	9	14	181
4	10	15	13⅜	14	188	4 × 8	17	16⅛	14⅛	10	15	254
5	11	15¾	13⅜	15⅛	255	5 ×10	18⅞	16⅜	15⅞	11	17½	396
6	12½	16½	16	17⅛	395	6 ×12	16¼	18¾	18⅞	12½	20½	590
8	15	17½	18½	21	655	8 ×16	19¼	22¾	21⅞	15	25½	1120
10	17½	19½	21¼	25¾	1400							

EXPERIENCE HAS SHOWN that it is very seldom Reducing Valves are too small. They are generally much too large, because they are usually ordered the same size as the reduced pressure main, consequently they never get a fair chance, because to supply the steam required they are only just off their seats. The amount of pressure reduction should be taken into account, and it has been found in practice that where the reduced pressure required is below one-third of the initial pressure, a reducing valve only one-half the size of the reduced pressure main can be fitted. The inlet steam connection can, therefore, be reduced and a smaller and therefore cheaper valve installed, which often means a considerable saving.

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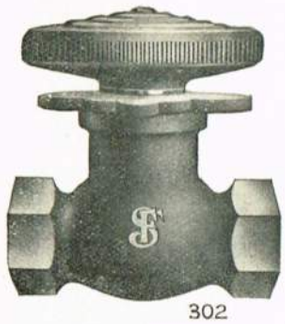
STEAM TRAPS.

Fig. 4070. THE MIDGET STEAM TRAP.

FOR STEADY PRESSURES BETWEEN ZERO AND 120 lbs.



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The Midget is suitable for indoor installations where good appearance is important. The body is polished gun-metal and the diaphragm bright nickel-silver. The Trap should be fitted close to the apparatus to be drained and requires no support other than pipe to which it is attached. Easily set for higher or lower pressures; loosen lock-nut at neck, screw crown anti-clockwise until steam issues freely; after flushing trap in this manner for a few moments screw crown clockwise until steam is just shut off and lock into position. The trap is now set and will adjust itself automatically to discharge condensate.

Discharge can be lifted two feet for every 1lb. of steam pressure if check-valve is fitted on outlet.

Operation of Trap.—Steam or water entering at inlet passes up central tube, lifts the loose valve which rests on top and comes into contact with the lower surface of a flexible metal diaphragm containing a volatile liquid and its vapour. The temperature of the steam influencing the volatile liquid creates pressure in the diaphragm and the lower surface expands onto the valve, holding it firmly onto its seat. Contact with water permits release of the valve and the trap discharges.

Diaphragm chamber, lock nut, and valve are renewable and interchangeable in similar sized traps. All traps tested on steam before despatch from works and guaranteed.

Size—Screwed B.S. Gas Threads, inch	¼	⅜	½	¾	1	1¼	1½	2
Price complete, G.M. female ends	**17/6**	**25/–**	**33/–**	**42/–**	**55/–**	**83/–**	**105/–**	**176/–**
Spare Parts—Condenser and Locknut	**11/3**	**15/–**	**20/–**	**27/6**	**35/–**	**45/–**	**62/–**	**95/–**
Valve	**1/5**	**1/8**	**1/9**	**2/6**	**3/–**	**3/9**	**6/–**	**7/–**
Overall length, inches	2¼	2½	3¼	4	4¾	5¼	6¾	9
Discharge, gallons per hour	18	25	38	160	480	720	960	1250

Steady Discharge. Hot Water at 212° F. Steam Pressure 50 lbs.

Fig. 4071. THE STANDARD WELLDECK STEAM TRAP.

FOR STEADY PRESSURES BETWEEN ZERO AND 150 lbs.

The Standard Welldeck can be installed in exposed positions, having diaphragm totally enclosed in a close-grained cast-iron or gun-metal body and cover. Very compact, small in bulk, neat in appearance, it requires no support other than condense pipe. It can readily be set to operate at any pressure over a wide range by loosening lock-nut, turning stem anti-clockwise, permitting steam to flush through for about 30 seconds after all water has been discharged, and then shutting off gradually until water only is discharged.

Steam entering at inlet passes up short central tube carrying loose valve guided by wings. Lifting valve, steam comes into contact with nickel silver or special copper alloy diaphragm containing volatile spirit and its vapour.

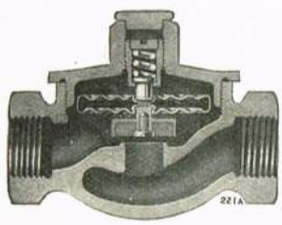
Valve disc, valve, diaphragm and spring interchangeable and renewable. All traps tested on steam before despatch from works and guaranteed.

Size—Screwed B.S. Gas Threads, inch	⅜	½	¾	1	1¼	1½	2
Price complete—C.I. female ends	**17/–**	**19/6**	**21/9**	**24/6**	**60/–**	**78/–**	**87/–**
G.M. female ends	**24/6**	**34/–**	**39/9**	**53/–**	**98/–**	**148/–**	**172/–**
Spare Parts—Condenser	**3/–**	**3/6**	**5/6**	**7/–**	**19/6**	**19/6**	**19/6**
Valve...	**1/8**	**1/8**	**2/6**	**3/–**	**3/9**	**6/–**	**7/–**
Spring	**–/8**	**1/–**	**1/2**	**1/5**	No Springs used.		
Overall length, inches	3¾	4¼	5	6¼	8¾	9½	9½
Discharge, gallons per hour	38	100	240	570	680	850	1100

Steady Discharge. Hot Water at 212° F. Steam Pressure 120 lbs.

Fig. 4072. THE V.P. WELLDECK STEAM TRAP.

FOR WIDELY FLUCTUATING PRESSURES BETWEEN ZERO AND 250 lbs.



Made with either cast-iron body and brass cover or all gun-metal for pressures up to 150 lbs. per sq. inch, and with gun-metal bodies only for pressures up to 250 lbs. per sq. inch.

Valve has positive lift, being loosely jointed to diaphragm which is on inlet side of trap and therefore very sensitive. Regulating stem is also loosely jointed to diaphragm and contains a safety spring which absorbs movement of diaphragm after valve is seated. Trap, when set for minimum pressure required, will operate over 80 lbs. sq. inch increase in pressure without adjustment. To set, remove safety cap and proceed as with Standard Welldeck. When cold, valve is fully open, permitting system to drain and air to escape on starting up.

Construction of valve and diaphragm makes traps eminently suitable for low pressure and vacuum systems as well as high pressure installations. Valve disc and diaphragm complete with valve and regulating stem, interchangeable and renewable. All traps tested on steam at works and guaranteed.

FOR PRESSURES BETWEEN VACUUM AND 150 lbs. Sq. Inch.

Size—Screwed B.S. Gas Threads, inch	⅜	½	¾	1	1¼	1½	2
Price—C.I. Body, brass cover, female ends	**21/3**	**25/–**	**27/6**	**31/–**	**75/–**	**98/–**	**110/–**
All G.M. female ends	**29/–**	**40/–**	**46/6**	**62/6**	**116/–**	**170/–**	**194/–**
Spare Parts, Condensers Valve and Stem	**13/–**	**15/–**	**17/6**	**20/6**	**42/–**	**52/–**	**58/–**
Overall length, inches	3¾	4¼	5	6¼	8¾	9½	9½
Discharge, gallons per hour	195	420	480	720	860	1020	1250

Steady Discharge. Hot Water at 200° F. Steam Pressure 20 lbs.

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STEAM TRAPS.

Fig. 4073. THE WELLDECK JUNIOR STEAM TRAP.

FOR VACUUM, VAPOUR, AND LOW PRESSURES INSTALLATIONS.

An angle pattern trap suitable for vacuum and pressures up to 60 lb. sq. inch. Made in three models: (a) All cast-iron body and cover with similar valve and diaphragm construction to V.P. Welldeck but no safety spring in regulating stem; (b) Cast-iron body with brass cover and diaphragm exactly similar to V.P. Welldeck; (c) All brass body and cover with diaphragm exactly similar to V.P. Welldeck and fitted with union inlet to facilitate fitting. Valve disc and diaphragm complete with valve and regulating stem interchangeable with similar type and renewable. Traps can be flushed through and set without opening. All traps tested at works on steam and guaranteed.

All types supplied nickel-plated at no extra charge.

Size	½ All C.I.	½ C.I. & Brass	½ All Brass	¾ All C.I.	¾ C.I. & Brass	¾ All Brass
Price C.I. for Constant Pressures screwed female inlet and outlet...	**23/-**	—	—	**25/-**	—	—
C.I. Body Brass Covers for variable pressures screwed female inlet and out.	—	**24/9**	—	—	**27/6**	—
All Brass for variable pressures union inlet, screwed female outlet	—	—	**27/9**	—	—	**32/-**
Spare Parts—						
Renewable valve disc	7	7	7	7	7	7
Condenser valve and stem	**14/-**	**15/6**	**15/6**	**15/-**	**16/6**	**16/6**
Overall dimensions, inches, "A"	1⅛	1⅛	1¼	1½	1½	1¼
"B"	1 11/16	1 11/16	3⅛	1⅞	1⅞	3⅛
"C"	2⅞	2⅞	3	3⅜	3⅜	3
Discharge, gallons per hour	140	140	140	300	300	300

"A" Centre of inlet to face of outlet. "B" Centre of outlet to face of inlet or end of union nipple. "C" Face of outlet to top of adjusting stem or safety cap.

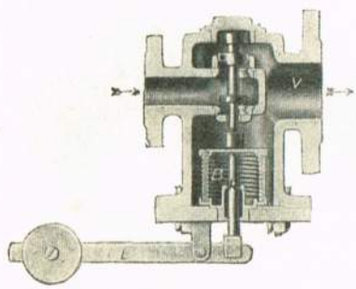

Fig. 4074. THE SAMSON PRESSURE REDUCING VALVE.

FOR STEAM, GAS, OR AIR.

Made in two styles:—Style "A" for reduction ratios exceeding 4 to 1, and having outlet twice the diameter of inlet, and Style "B" with equal inlet and outlet. No rubber or non-metallic substance employed and no springs used. Steam, gas or air passing through double beat valve into low pressure chamber exerts pressure on frictionless piston B which yields and tends to close valve when weight-loaded resistance is overcome. Low pressure chamber tapped on side for gauge, and for relief valve on top.

Unless otherwise specified, bodies supplied in best close-grained cast iron; valve seats, gun-metal; valves, phosphor bronze; levers wrought iron; weights, cast iron. To adjust slide weight in to reduce, and out to increase low pressure.

Samson Reducing Valves are not designed as stop valves and should not be used as such. All valves tested before leaving works and guaranteed.

STYLE A FOR REDUCTION RATIOS EXCEEDING 4 TO 1.

Diameter—Inlet, ins.	½	¾	1	1¼	1½	2	2¼	2½	3	3½	4	5	6	8
Outlet, inches	1	1½	2	2½	3	4	4½	5	6	7	8	10	12	16
Length of Valve	4¾	5⅛	5½	5⅞	6¾	7 5/16	9⅛	10¼	11	12¼	13½			
Flange Diam,—Inlet, ins.	3¾	4	4¾	5¼	5½	6½	7¼	7¼	8	8½	9	11	12	14½
Outlet, ins.	4½	5¼	6	6½	7¼	8½	10	10	11	12	13¼	16	18	22½
Bolt Circle— Inlet, ins.	2⅝	2⅞	3 7/16	3⅞	4⅛	5	5¾	5¾	6½	7	7½	9¼	10¼	12½
Outlet, ins.	3¼	3⅞	4½	5	5¾	7	8¼	8¼	9¼	10¼	11½	14	16	20½
No. and Size of Screws, H.P.	4–½	4–½	4–⅝	4–⅝	4–⅝	4–⅝	8–⅝	8–⅝	8–⅝	8–⅝	8–⅝	8–⅝	12–¾	12–¾
No. and Size of Screws, L.P.	4–½	4–½	4–½	4–½	4–½	4–⅝	4–⅝	4–⅝	4–⅝	4–⅝	4–⅝	8–⅝	8–⅝	8–⅝
Price	**£7/10**	**£8/10**	**£9/5**	**£10/10**	**£12**	**£12/15**	**£14/15**	**£16/5**	**£18/5**	**£20**	**£22/10**	**£37/10**	**£47/10**	**£56**

STYLE B FOR REDUCTION RATIOS UP TO 4 TO 1.

Diam., Inlet & Outlet, ins.	½	¾	1	1¼	1½	2	2¼	2½	3	3½	4	5	6	8
Length of Valve, inches	4⅜	5⅛	5½	5⅞	6¾	7 5/16	6⅛	10¼	11	12¼	13½			
Flange Diameter, inches	3¾	4	4¾	4¾	5¼	6	9½	6½	7¼	8	8½	10	11	3¼
Bolt Circle Diam., inches	2⅝	2⅞	3¼	3 7/16	3⅞	4½	5	5	5¾	6½	7	8¼	9¼	11½
No. and Size of Screws	4–½	4–½	4–½	4–½	4–½	4–⅝	4–⅝	4–⅝	4–⅝	4–⅝	4–⅝	8–⅝	8–⅝	8–⅝
Price	**£7/5**	**£8/5**	**£9**	**£10/5**	**£11/15**	**£12/10**	**£14/10**	**£15**	**£17**	**£18/10**	**£20/15**	**£35**	**£44/15**	**£53**

Fig. 4075. THE EUSTON THERMOSTATIC VALVE.

FOR REGULATING THE TEMPERATURE OF STEAM OR WATER HEATED TANKS.

A simple, robust and safe apparatus for keeping steam, gas, or water heated vessels at a constant temperature without waste of heat or necessity for supervision. Thermostat screws into vessel or outflow pipe and controls valve through which heating medium passes. Operated by expansion of incompressible liquid giving full shut of valve from full open within 10° F. Principally intended for cases where one fixed temperature is required but can be adjusted ± 15° F. from temperature for which it is ordered.

Valve stem provided with 1¼in. gas thread for screwing into tank wall. Back nut only necessary when wall is very thin. Eustons up to 1in. made with gun-metal single-beat valve with unions or cast-iron double heat valves. Eustons above 1in. stocked with G.M. fitted C.I. valves, flanged, but can be supplied all G.M. if desired.

When ordering state (a) temperature required; (b) steam pressure: (c) nature of heated fluid if it attacks brass.

Size, screwed female, inch	½	¾	1	1¼	1½	2
Price, C.I. body, D.B. valve	**£6/5/0**	**£7/8/0**	**£8/1/0**	**£8/8/0**	**£9/10/0**	**£15/2/0**
G.M. body, S.B. valve, G.M. unions	**£6/0/0**	**£7/0/0**	**£7/12/0**	—	—	—
Length of valve—C.I. D.B.	3⅜	4⅛	4⅜	5¼	6	6½
G.M. S.B.	4¾	5½	6	—	—	—
Length of thermostat over threads	16¾	16¾	18¾	21¾	21¾	24¾

D.B.—Double beat. S.B.—Single beat. Threads, 1¼in. gas.

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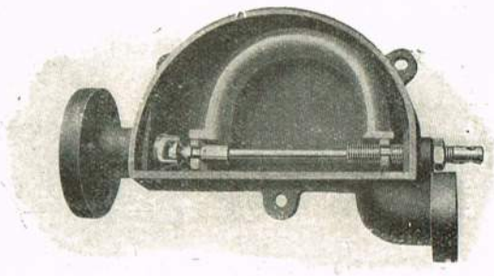
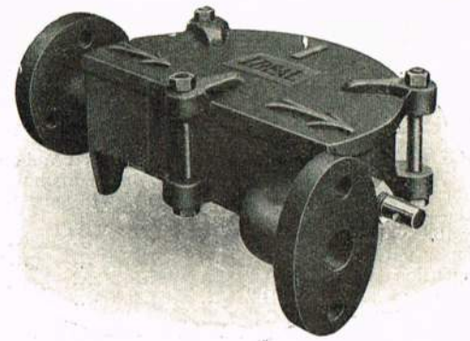
STEAM TRAPS.

Fig. 4076. GENUINE "HEINTZ" PATENT STEAM TRAPS.

For Pressure up to 200 lbs. per square inch. Complete with loose flanges, bolts and joints. Automatic in action. Require no regulating or attention.



Trap with cover removed.



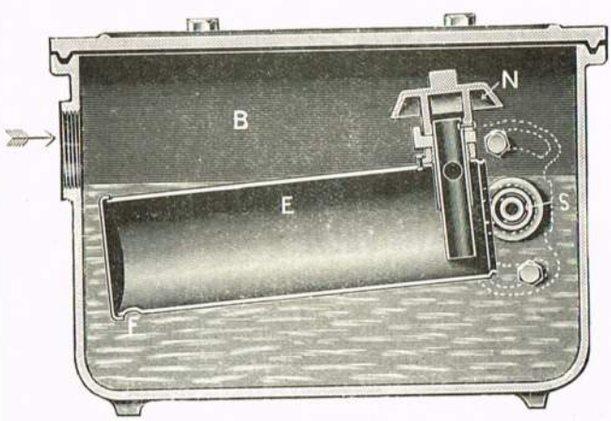
This is not a metal-expansion Trap depending on the slow action under varying temperatures of a solid rod or bar of metal, but works by the expansion and contraction of a curved hollow Tube Spring hermetically sealed, containing a highly volatile liquid, which renders it extremely sensitive.

At starting, the valve is wide open, the condensation water flowing through. Upon any steam arriving with the condensation, meaning a rise in temperature, the Tube-Spring expands and closes the valve. Thus it is open at 211° and closed at 212°. The steam in inlet pipe then in turn condenses, cools the Tube-Spring, which relaxes and opens the valve. In actual working the valve is always just open, allowing the free escape of condensation, but no steam to pass.

Size No.	00	0	1	2	3	4	5	6	7	8
Diam. of Pipe Connections, inches ...	½	½	½	¾	¾	1	1¼	1½	2	2
Diam. of valves, inches	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2
Capacity in feet of 1in. pipe according to radiating connections	200 to 500	250 to 1000	500 to 3000	1000 to 5000	1500 to 6000	2500 to 10000	4500 to 16000	10000 to 38000	20000 to 40000	35000 to 70000
Gallons of condensation per minute ...	1	2	5	8	15	30	60	100	150	250
Price	**£1 2 6**	**£1 7 0**	**£1 15 0**	**£2 7 6**	**£3 3 6**	**£4 0 0**	**£5 5 0**	**£6 15 0**	**£8 5 0**	**£10 5 0**

Note.—Nos. 00—4 can be supplied with screwed ends.

Fig. 4077. THE "LANCASTER" PATENT STEAM TRAP.



Size of Inlet Inches	Non-Lifting Class 1, 2,3 Size of Outlet Inches	Class 1, 2, 3 without Union	Low Lift Class 6 without Unions	Brass Union each	Union end Dirt Extractors
½	1¼	**£2 17 0**	**£4 17 0**	**4/3**	**18/–**
¾	1¼	**£3 6 6**	**£5 14 0**	**5/3**	**20/–**
1	1½	**£4 5 6**	**£6 10 0**	**7/4**	**24/–**
1¼	1½	**£5 10 0**	**£7 0 0**	**11/–**	**27/–**
1½	2	**£6 12 6**	**£8 7 6**	**14/–**	**36/–**
2	2	**£7 18 0**	**£9 14 0**	**21/–**	**45/–**
2½	3	**£13 5 0**	**£16 10 0**	**35/–**	**72/6**
3	3	**£15 12 6**	**£20 5 0**	**52/6**	**110/–**

Valves up to 1", **2/–** Seatings, **9/6**

Valves over 1", **2/6** Seatings, **15/–**

Nickel Valves and Seatings, 50% extra on above prices.

Class 1.—Is adapted for all cases where large quantities of water have to be dealt with at low pressures, say from 2 to 20 lbs. per square inch, and is specially suited for Drying Cylinders, Bleaching and Dyeing Kiers, Soap Boiling Vats, Paper Mills, Brewers' Pans, etc.

Class 2.—Used for General Draining purposes, and for Steam Pressures varying from 20 to 90 lbs. per square inch. They are supplied for Draining Ranges of Steam Pipes, for both Driving and Heating purposes, and for High-Pressure Boiling work.

Class 3.—For High Pressures ranging from 90 to 250 lbs. per square inch. Specially adapted for Electric Light Stations and other places where ranges of Steam Pipes, carrying the above pressures, are used.

Class 6.—**Low Lifting Traps.**—For where the pressure **does not exceed 120 lbs.,** and the discharge water is not lifted **more than 10 feet** above the Trap.

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SAFETY VALVES, HOSE FITTINGS.

Fig. 4080.
Heavy Gun-metal Safety Valve
With phosphor bronze spring.
Adjustable to 30 lbs. pressure.

Size, inches	½	¾	1
Price each	**5/6**	**6/–**	**6/8**

Extra springs, **9/–** doz.

Fig. 4082. Heavy Gun-metal Dead-weight Safety Valve.
with iron weights. Adjustable from 8 to 32 lbs. pressure.

Size, inches	½	¾	1
Price each	**6/8**	**7/6**	**10/–** complete
Weights only	**2/3**	**2/6**	**3/–** per set.

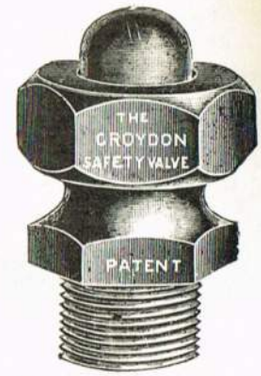

Fig. 4081. Croydon Safety Valve.
complete with wire guard.

Size, inches	¾	1
Complete, each ...	**6/–**	**8/–**
Extra wire guards	**9d.**	**9d.**
Extra lead cones ...	**1/–**	**1/–**

Fig. 4090. Strong Cast Brass Hose Clips.

Actual size, inches ...	1¼	1½	1¾	2	2¼	2⅜	2½	2¾	3
Price per dozen ...	**13/9**	**14/3**	**15/3**	**16/6**	**19/–**	**21/–**	**25/–**	**28/6**	**35/–**

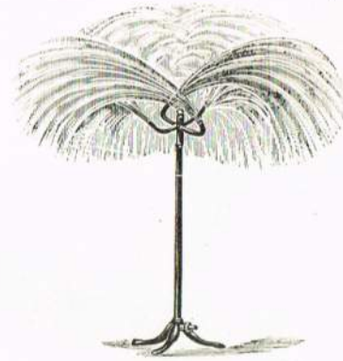

Fig. 4091. Lawn Sprinklers.
with revolving arm.
4 arms.
Height, 48″. Price, **15/–** each.

Fig. 4092. Connecting Unions.
Hexagon nut. Prices per doz.

Size, inches	½	⅝	¾	1
Heavy pattern	**17/–**	**24/–**	**29/6**	**54/9**
Light pattern	**12/6**	**17/–**	**24/–**	**45/–**

Fig. 4093. Soldering Unions.
Hexagon nut. Prices per doz.

Size, inches	½	⅝	¾	1
Heavy pattern	**17/–**	**24/–**	**29/6**	**54/9**
Light pattern	**12/6**	**17/–**	**24/–**	**45/**

Fig. 4096. Repairing Joints.

Size, inches	½	⅝	¾	1
Price per doz.	**2/6**	**3/3**	**4/3**	**7/9**

Fig. 4094. Hose Branch.
With rose but without tap.

Size, inches	½	⅝	¾	1
Price, dozen	**20/3**	**24/–**	**32/6**	**75/–**

Fig. 4095. Hose Branch.
With rose, nozzle and tap.

Size, inches	½	⅝	¾	1
Price per doz.	**35/–**	**45/–**	**60/–**	**120/–**

Fig. 4097. Royle's Tap Unions.
Complete with rubbers.

Size, inches	½	⅝	⅝ × ½	¾
Price per doz.	**12/9**	**18/6**	**18/6**	**24/6**
Size, inches	¾ × ½	¾ × ⅝	1	
Price per doz.	**24/6**	**24/6**	**50/–**	

Fig. 4098. Hose Reels. Painted frames and drums.

No.	Will carry hose feet	Diam. drum ins.	Width drum ins.	Price each
0	60—½″	10½	10	**33/–**
1	120—½″	14	10	**36/–**
2	120—⅝″	16	10	**39/–**
3	120—¾″	17	13	**45/–**
4	200—¾″	18	14	**51/–**

Fig. 4099. Cantilever Hose Reels.

No.	Dimensions inches	Capacity	Price as Painted	Price as Galvd.
00	17½ × 6½	60—½″	**6/3**	**7/6**
0	19½ × 7½	60—⅝″; 120—½″	**6/9**	**8/–**
1	22 × 9	120—⅝″; 60—¾″	**8/3**	**9/6**
2	26 × 11	120—¾″; 60—1″	**11/–**	**12/9**
3	30 × 14	120—1″	**21/–**	**28/6**
4	36 × 17½	180—1″	**27/6**	**36/–**

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SHEETING, Etc.

Jenkins '96 Sheeting.

Fig. 5000. Flexible. Will not crack For water, steam or air. Acids or ammonia. Hot or cold.
For high pressures.

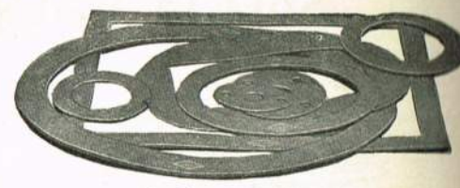
Price List of Jenkins '96 Sheeting.

Regular	**4/2**	per lb.
With steel wire insertion....	**4/2**	,,
With brass wire insertion	**5/3**	,,

Jenkins '96 Sheeting, as regularly made, is 36″ wide.

Approximate Weights per Square Yard.

Thicknesses, inches		$^1/_{32}$	$^1/_{16}$	$^3/_{32}$
Regular	lbs.	$2\frac{3}{4}$	$5\frac{1}{2}$	$8\frac{1}{4}$
Steel wire	lbs.	—	$6\frac{1}{2}$	$9\frac{1}{4}$
Brass wire	lbs.	—	8	$10\frac{3}{4}$
Thicknesses	inches	$\frac{1}{8}$	$^3/_{16}$	$\frac{1}{4}$
Regular	lbs.	11	$16\frac{1}{2}$	$22\frac{1}{2}$
Steel wire	lbs.	12	$17\frac{1}{2}$	$23\frac{1}{2}$
Brass wire	lbs.	$13\frac{1}{2}$	19	25



Jenkins '96 Gaskets.

Fig. 5001. These gaskets are cut from Jenkins '96 sheeting, and we are prepared to furnish at short notice gaskets of any size and in any quantity. When ordering, give outside and inside diameter and thickness :· and if shape is irregular, send drawing or template.

PRICES.

Gaskets, 5″ in diam. and over, **6**/– per lb.
Gaskets with bolt holes, **3d.** per lb. net additional.
On gaskets less than 5″ in diameter, special prices quoted on application.

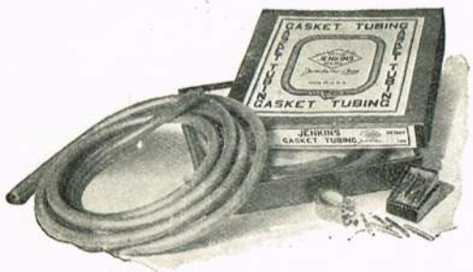


Fig. 5002.

Fig. 5002. GASKET TUBING.

This tubing is manufactured from a compound somewhat similar to that used in the Jenkins '96 Packing, and is well adapted for the packing of steam joints, especially hand-holes, man-holes, etc.

Made $\frac{3}{8}$″, $\frac{1}{2}$″, $\frac{5}{8}$″, and $\frac{3}{4}$″ in diameter, in lengths of about 12 feet. Packed in boxes, each box containing from 5 lbs. to 7 lbs. of tubing, together with a supply of plugs and adhesive tape.

Directions : Cut the tubing with ends bevelled and fitted nicely together, insert the soft plug A, one-half in each end, and wrap the joint smoothly with the adhesive tape B, and the gasket is ready for use.

Price .... **5/9** per lb.

Fig. 5003.

Dixon's Ticonderoga Flake Graphite, Nos. 1 and 2.

The recognised standard lubricating graphite, in two grades : No. 1, coarse, No. 2, fine. Infinitely useful for steam engines, gas engines, air compressors, etc.

632	1 lb. tins	(36 in case)	....	**2/8** each	**96**/–	Case
633	5 lb. tins	(10 in case)	....	**12/9** ,,	**127/6**	,,
634	10 lb. tins	(5 in case)	....	**25**/– ,,	**125**/–	,,
644	25 lb. box	....	....	**62**/– ,,		
645	50 lb. box	....	....	**120**/– ,,		
646	100 lb. keg	....	....	**235**/– ,,		
646½	200 lb. ½-barrel	....	....	**460**/– ,,		
647	400 lb. barrel	....	....	**£12 15 0** cwt.		

Fig. 5004. Dixon's Pipe Joint Compound.

Makes the tightest joints, prevents rusting and corrosion, does not get hard or brittle, but allows parts to be opened with ease at any time.

693	1 lb. tins	(36 in case)	....	**2/6** each	**90**/–	Case
694	5 lb. pail	(10 in case)	....	**10/6** ,,	**105**/–	,,
695	10 lb. pail	(6 in case)	....	**19/6** ,,	**117**/–	,,
696	25 lb. pail	....	....	**45**/– ,,		
697	50 lb. keg	....	....	**84**/– ,,		
698	100 lb. keg	....	....	**158**/– ,,		
699	625 lb. barrel	....	....	**170**/– cwt.		

Fig. 5005. Dixon's Graphite Cup Greases, Nos. 3 and 5.

Only fine mineral oil is used in the composition of these greases ; they will not, therefore, turn rancid or gum. Can be used in grease cups or open bearings for the lubrication of nearly all classes of engines, machinery and shafting. No. 3, medium No. 5 stiff.

25 lb. pail	**55**/– each
50 lb. keg	**83**/– each
100 lb. keg	**156**/– each
400 lb. barrel...	**160**/– each

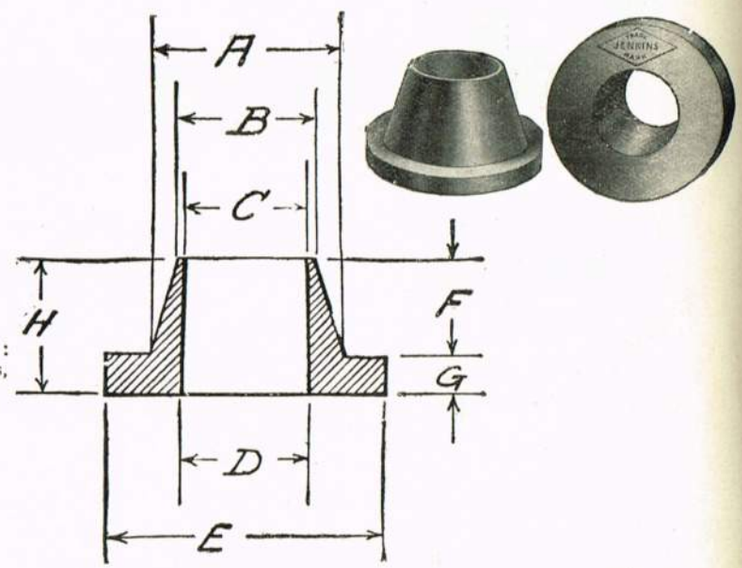


Fig. 5006. Conical Gauge Glass Rings similar in analysis to '96 sheeting, not affected by heat, and can be used repeatedly when renewing gauge glasses. Price **4/6** per dozen.

TABLE OF SIZES.

Size Glass.	Number	A	B	C	D	E	F	G	H	Rings Stamped.
$\frac{1}{2}$″	2	$^{25}/_{32}$″	$^9/_{16}$″	$^{15}/_{32}$″	$\frac{1}{2}$″	$1\frac{1}{8}$″	$\frac{1}{2}$″	$^5/_{32}$″	$^{11}/_{16}$″	$\frac{1}{2}$″–2
$\frac{5}{8}$″	3	$\frac{7}{8}$″	$^{21}/_{32}$″	$^{19}/_{32}$″	$\frac{5}{8}$″	$1\frac{1}{4}$″	$^7/_{16}$″	$^5/_{32}$″	$^{19}/_{32}$″	$\frac{5}{8}$″–L
	4	$1^1/_{16}$″	$^{21}/_{32}$″	$^{19}/_{32}$″	$\frac{5}{8}$″	$1\frac{3}{8}$″	$\frac{1}{2}$″	$^3/_{16}$″		$\frac{5}{8}$″–H
$\frac{3}{4}$″	6	$1^1/_{16}$″	$^{25}/_{32}$″	$^{23}/_{32}$″	$\frac{3}{4}$″	$1\frac{1}{2}$″	$\frac{1}{2}$″	$^3/_{16}$″	$^{11}/_{16}$″	$\frac{3}{4}$″–L
	7	$1\frac{1}{4}$″	$\frac{3}{4}$″	$^{11}/_{16}$″	$\frac{3}{4}$″	$1^{17}/_{32}$″	$\frac{3}{4}$″	$^3/_{16}$″	$^{15}/_{16}$″	$\frac{3}{4}$″–H
	8	$1\frac{1}{8}$″	$^{25}/_{32}$″	$^{23}/_{32}$″	$\frac{3}{4}$″	$1\frac{1}{4}$″	$\frac{3}{4}$″	$^3/_{16}$″	$^{15}/_{16}$″	$\frac{3}{4}$″–S

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RUBBER SHEET, HOSE, ETC.

Fig. 5007. VULCANISED INDIA-RUBBER SHEET AND INSERTION.

Solid sheet or insertion rubber same price.
Sheets, $^1/_{16}$″ thick and upwards.
Size of sheets, 3ft. × 3 ft.

Qualities	"C" Red	No. 1 E.R. Grey	Steam	No. 6 Dark
Per lb.	**6/9**	**4/6**	**4/–**	**2/6**

Square. Round.

Fig. 5008.

INDIA-RUBBER SOCKET RINGS.

For hot water pipes.

	Square	Round
No. 1 Quality ...	**6/9**	**9/–** per lb.
No. 2 Quality ...	**5/6**	**6/–** ,,
No. 3 Quality ...	**3/9**	—

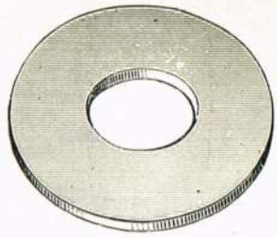

Fig. 5009. INDIA-RUBBER WASHERS

Round.

No. 1, Grey	**4/6**	per lb.
No. 3, Dark	**3/9**	,,

Oval Washers,
9d. per lb. extra sub.
Any size and shape made to order.

Fig. 5010. SQUEEGEES. Fitted with superior rubbers.

Length of rubber, inches ...	12	14	16	18	20	22	24
Width of rubber, inches ...	2	2	2	2	2	2	2
Thickness of rubber, inches ...	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Price per dozen	**24/–**	**28/–**	**32/–**	**36/–**	**40/–**	**44/–**	**48/–**

With handles and galvanised stays, **27/–** dozen extra.
Squeegee Rubber ... **4/3** per lb.

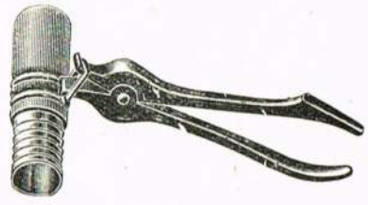

Fig. 5011. HOSE WIRES.
Fig. 5012. Pliers for same.

Sizes 0 to 3 wires :
For $\frac{1}{2}$″, $\frac{5}{8}$″, $\frac{3}{4}$″ hose ... **12/–** gross
Sizes 4, 5, 6 wires :
For $\frac{3}{4}$″ and 1″ delivery hose **15/–** gross
Malleable pliers ... ... **1/8** per pair

Fig. 5013.
BEST QUALITY FLEXIBLE METALLIC TUBING.

Gas tight.

Made in lengths of 60 ft. coils.

Internal diameter, sizes, inches ...	$\frac{1}{4}$	$^5/_{16}$	$\frac{3}{8}$
Price per foot ...	**3½d.**	**4d.**	**5½d.**
Rubber ends per gross	**9/–**	**9/9**	**15/–**

Fig. 5014.

BRAIDED GARAGE OR PNEUMATIC TOOL HOSE.

Will protect the hose from the action of grease and petrol. In 3-ply only.

Diameter, inches	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
Price per foot ...	**1/5½**	**1/8½**	**1/10½**	**2/7½**

Fig. 5015. BREWERS' DELIVERY HOSE.

Very pliable and durable. Lined with sweetened rubber. Will not affect the taste of liquids, hot or cold.

Diameter, inches ...	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
2-ply, per foot ...	**1/2¾**	**1/4¼**	**1/8½**	**2/1¼**	**2/5**	**2/9¾**	**3/4**	**3/6¾**
3-ply, per foot ...	**1/6**	**1/8½**	**2/2¼**	**2/7**	**2/11½**	**3/2½**	**3/8**	**4/0½**
4-ply, per foot ...	**1/11½**	**2/2½**	**2/9¾**	**3/4**	**3/8**	**3/11¼**	**4/2**	**4/8**
5-ply, per foot ...	**2/4**	**2/8½**	**3/5¼**	**4/0½**	**4/5**	**4/10¾**	**5/6¼**	**6/–**
Diameter, inches ...	...	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4
2-ply, per foot ...	...	**3/8**	**4/2**	**4/6¾**	**5/3½**	**5/4¾**	**6/–**	**6/4¾**
3-ply, per foot ...	...	**4/5**	**4/10¾**	**5/3½**	**6/–**	**6/6**	**7/1½**	**7/8½**
4-ply, per foot ...	...	**5/2**	**5/10½**	**6/6**	**7/2¾**	**7/5¾**	**8/2¾**	**8/11½**
5-ply, per foot ...	...	**6/6**	**7/1½**	**7/8½**	**8/7**	**9/1**	**9/11**	**10/3½**

Fig. 5016. VULCANISED INDIA-RUBBER GAS TUBINGS.

	Internal diam., inches	$\frac{1}{8}$	$^3/_{16}$	$\frac{1}{4}$	$^5/_{16}$	$\frac{3}{8}$	$^7/_{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
No. 1.	Red, extra stout, per ft.	**2¾d.**	**3d.**	**4d.**	**5d.**	**7d.**	**8d.**	**9d.**	**1/–**	**1/1½**
No. 2.	,, stout, per foot ...	—	—	**3½d.**	**4d.**	**5d.**	**7d.**	**8d.**	—	—
No. 3.	,, ordinary (plain or wired inside) per foot...	—	—	—	**3d.**	**3¾d.**	—	—	—	—

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HOSE PIPE.

Fig. 5017. PATENT SEAMLESS MOULDED HOSE.

Diameter, inches	3/8	1/2	5/8	3/4	1	
1-ply	–/5¾	–/7	—	—	—	per foot
2-ply	—	–/8½	–/10½	1/–	—	per foot
3-ply	—	–/10¼	1/–	1/2	1/9½	per foot

Fig. 5018. HOT-HOUSE QUALITY.

Specially suitable for nurserymen. Made only in 3-ply.

½", **1/9** per foot. ⅝", **2/1½** per foot. ¾", **2/6** per foot. 1", **3/3** per foot. 1¼", **3/9** per foot.

Fig. 5019. ORDINARY QUALITY GARDEN HOSE. PLAIN.

1-ply. ½", **5d.** foot. ⅝", **6¼d.** foot. **2-ply**. ½", **6¼d.** foot. ⅝", **7½d.** foot. ¾", **9d.** foot.
3-ply. ½", **7½d.** foot. ⅝", **9d.** foot. ¾", **10½d.** foot. 1", **1/2½** foot.

Fig. 5020. ORDINARY QUALITY GARDEN HOSE. ARMOURED.

2-ply. ½", **9½d.** foot. ⅝", **11d.** foot. ¾", **1/1½** foot. **3-ply**. ½", **10¾d.** foot. ⅝", **1/0½** foot. ¾", **1/3** foot. 1", **1/9** foot.

Fig. 5021. CONTINUOUS LENGTH HOSE.

In reels of 250 or 500 feet long without a join. The hose for any purpose. Every foot of hose measured and marked in plain figures.

Size, inches	½	⅝	¾	1	1¼	
Price	–/9	–/10	–/11	1/4	2/9	per foot

Fig. 5022. Quality No. 1 Cable.

Price	1/–	1/1½	1/3	1/11	2/9	per foot.

Fig. 5023. INDIA-RUBBER SUCTION HOSE. Wired Inside.

Used for steam fire engines, traction engines, pumps, etc.

Diameter, inches	¾	⅞	1	1¼	1½	1¾	2	2¼	2½	
2-ply	1/1½	1/3½	1/6¼	1/9½	2/2	2/5½	2/10½	3/2½	3/8¼	per foot
3-ply	1/3¾	1/6	1/9	2/0¾	2/5¼	2/9½	3/3¼	3/7½	4/1¾	,,
4-ply	1/6	1/8½	1/11¾	2/4	2/9¼	3/2	3/8	4/0¾	4/7¾	,,
5-ply	—	—	2/3¾	2/7½	3/1¼	3/6¼	4/0¾	4/6	5/1½	,,
Diameter, inches		2¾	3	3½	4	4½	5	5½	6	
2-ply		4/1¾	4/6½	5/4½	6/5¼	7/3¾	8/1¾	8/11½	10/0¾	per foot
3-ply		4/7½	5/1¼	6/0¼	7/2½	8/1¾	9/0¾	9/11¾	11/2	,,
4-ply		5/1¾	5/8¼	6/8¼	7/11½	9/–	10/0¼	11/0¼	12/3¾	,,
5-ply		5/8¼	6/3¼	7/4½	8/8¾	9/10¾	11/0¼	12/1½	13/6½	,,

Fig. 5024. INDIA-RUBBER EMBEDDED SUCTION HOSE. Smooth Bore.

Diameter, inches	¾	⅞	1	1¼	1½	1¾	2	2¼	2½	
2-ply	1/8	1/11½	2/7	3/3½	4/–	4/8	5/4	6/–	6/8	per foot
3-ply	1/10	2/1	2/10	3/7	4/4	5/0½	5/9	6/5½	7/2	,,
4-ply	—	—	3/1½	3/11	4/8	5/5	6/2	6/11	7/8½	,,
5-ply	—	—	3/5¼	4/3	5/–	5/9¾	6/7¼	7/5½	8/3	,,
Diameter, inches		2¾	3	3½	4	4½	5	5½	6	
2-ply		7/4	8/1	9/11	11/9½	13/6	15/3	17/–	18/10	per foot
3-ply		7/10½	8/8	10/7	12/7	14/3½	16/1	17/10½	19/9	,,
4-ply		8/5¾	9/3½	11/3½	13/4	15/1½	17/–	18/10½	20/10	,,
5-ply		9/0¾	9/11	12/–	14/1½	15/11½	17/11	19/11	21/11	,,

Fig. 5025. PATENT SEAMLESS CANVAS HOSE. No. 1 Quality.

Suitable for fire brigades, mills, factories.

Diameter, inches	¾	1	1¼	1½	1¾	2	2½	3	3½	per foot
Flat width in m/m	37	43	54	64	73	84	103	123	144	
Price per foot	1/5	1/6	1/9	2/–	2/3	2/6	3/–	3/6	4/–	per foot
Diameter, inches	4	4½	5	6	7	8	9	10	12	
Flat width in m/m	164	183	203	243	283	323	364	403	483	
Price per foot	4/6	5/–	5/6	6/6	7/8	8/6	9/6	10/6	12/6	per foot

No. 2 Quality. Suitable for Export.

Diameter, inches	¾	1	1¼	1½	1¾	2	2½	3	3½	
Flat width in m/m	37	43	54	64	73	84	103	123	144	
Price per foot	–/11	1/–	1/3	1/6	1/9	2/–	2/6	3/–	3/6	per foot
Diameter, inches	4	4½	5	6	7	8	9	10	12	
Flat width in m/m	164	183	203	243	283	323	364	403	483	
Price per foot	4/–	4/6	5/–	6/–	7/–	8/–	9/–	10/–	12/–	per foot

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LAWN MOWERS.

Fig. 5050.

Model C "QUALCAST" LAWN MOWER.

Every part guaranteed against defective material and workmanship.

SPECIFICATION.—Driving wheels 7″ diameter by 1¼″ tread. Cutting cylinder 5″ diameter, fitted with 5 blades best Sheffield steel. Lip edge section bottom blade. Spanner supplied which fits all nuts. Attractively finished in "Qualcast" blue, and each machine packed in a separate box.

NOTE.—The 12″ and 14″ machines are fitted with bronze bearings.

Width of cut, inches	....	8	10	12	14
Price of machine, each	....	**38**/–	**40**/–	**42**/–	**44**/–
Grass box, each extra	....	**10**/–	**10**/–	**10**/–	**10**/–

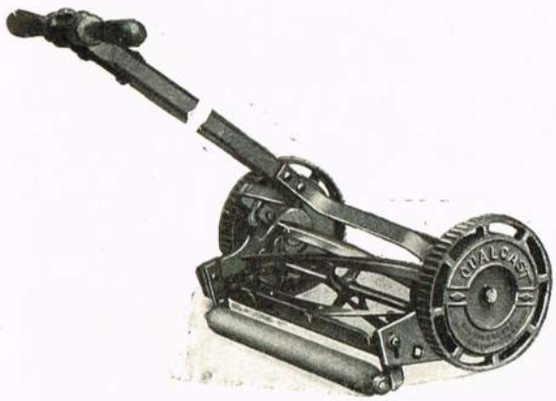

Fig. 5051.

Model D "QUALCAST" LAWN MOWER.

All models fitted with Bronze bearings.

SPECIFICATION.—Driving wheels 9″ diameter by 1¼″ tread, tread made with extra deep serrations to get a good grip on rough ground. Cutting cylinder 5½″ diameter, fitted 5 blades of best Sheffield steel. Lip edge section bottom blade. Bronze bearing with single screw adjustment and locking nut fitted to all sizes. Finished attractively in "Qualcast" blue, and each machine packed in a separate box.

Width of cut, inches	....	10	12	14	16
Price of machine, each	....	**46**/–	**48**/–	**50**/–	**52**/–
Price of grass box, each		**10**/–	**10**/–	**10**/–	**10**/–

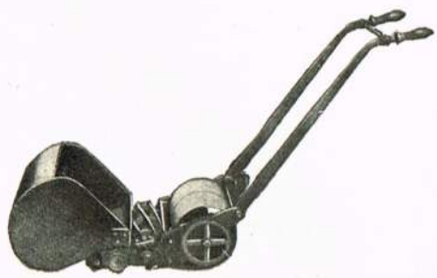

Fig. 5052.

"QUALCAST MAJOR" CYLINDER LAWN MOWER.

Made in one size only—12″.

Easy running. Tow rope not necessary with this machine. One man can use it with ease. Handles are adjustable to suit the height of user. Supplied with usual guarantee.

SPECIFICATION.—Laminated steel chain drive on malleable iron sprockets. Cutting cylinder 5″ diameter, fitted with 8 blades of best Sheffield steel on 3 malleable iron spiders. Bottom blade of lip edge section. Split bronze bearings. Wooden handle grips. Height of cut regulated by hand wheel adjustment, no spanner needed for this. Painted attractively in "Qualcast" blue and supplied complete with grass box.

Price complete with grass box:

12″ machine .... **130**/– each.

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SCYTHES, GARDEN ROLLERS, Etc.

Fig. 5060. Hedge Slashers.

8″ .... **69**/– per dozen. 9″ .... **70/6** per dozen. 10″ .... **72**/– per dozen.

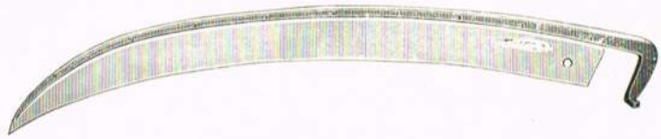

Fig. 5061. Rivetted Blade Scythes.

Size, inches	30	32	34	36	38	40	42	44
Price per dozen	**82/6**	**82/6**	**85/6**	**85/6**	**88/6**	**91/6**	**94/6**	**97/6**

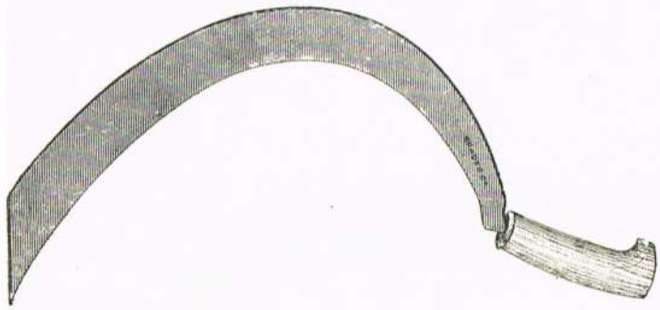

Fig. 5062. Reap Hook.

Flat Blade.

Size, inches	1	2	3	4
Price per dozen	**29/6**	**31/6**	**33/6**	**35/6**

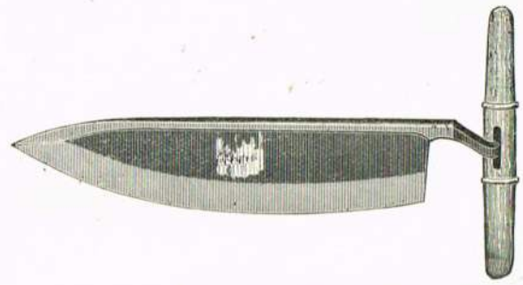

Fig. 5063. Hay Knife.

With cross handle.

Size, inches	20	22	24
Price per dozen	**156**/–	**168**/–	**180**/–
Size, inches	26	28	30
Price per dozen	**192**/–	**204**/–	**228**/–

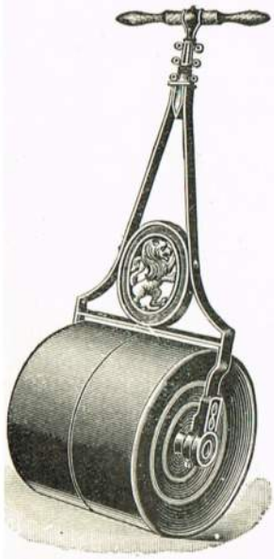

Fig. 5064 Double Cylinder Garden Rollers.

The cylinders are bored and edges machined. The bearings are of substantial design, fitted with oil groove. Handle irons are of strong wrought steel. Finished in green and red enamel. Handle grip is varnished.

Size, inches	14×14	16×16	18×18
	Cwt. qrs. lbs.	Cwt. qrs. lbs.	Cwt. qrs. lbs.
Weight	1 3 0	2 1 9	2 3 14
Price	**£4 5 0**	**£4 15 0**	**£5 10 0**
Size, inches	20×20	22×22	24×24
	Cwt. qrs. lbs.	Cwt. qrs. lbs.	Cwt. qrs. lbs.
Weight	3 2 9	4 0 8	5 1 0
Price	**£6 12 0**	**£9 0 0**	**£10 10 0**

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PRESSURE GAUGES.

BOURDON PRESSURE, VACUUM AND COMPOUND GAUGES.

Manufactured on the most approved methods. The dial of each instrument being calibrated under separate test against undoubted standards.

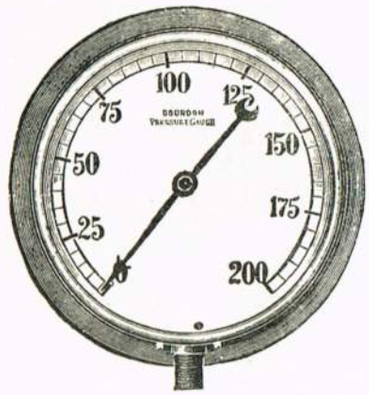

Fig. 5070.
Bourdon Pressure Gauges.

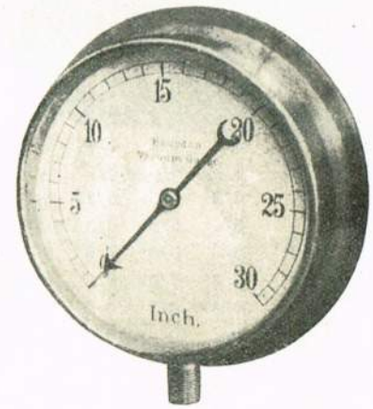

Fig. 5071.
Compound Pressure and Vacuum Gauge.

Diameter of dial, inches	3	4	5	6	7	8	9	10	12
Connecting nipple screwed pipe sizes, inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
Pressure gauge, 10 lbs. and up to 500 lbs.	**22/6**	**23/3**	**26/3**	**28/3**	**31/6**	**51/–**	**60/–**	**65/–**	**97/–**
Pressure Gauge, 500 lbs. to 700 lbs.	**24/–**	**25/6**	**28/6**	**30/6**	**34/–**	**54/–**	**63/–**	**68/–**	**102/–**
For Vacuum or Pressure to 300 lbs.	**25/6**	**26/3**	**29/3**	**31/6**	**34/6**	**54/–**	**63/–**	**68/–**	**101/–**

Fig. 5072. HYDRAULIC PRESSURE GAUGES.

Diameter of dial, inches	4	5	6	7	8	10	12
Connecting nipple screwed pipe sizes, inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
Without Maximum Pointer :							
Graduated up to 1000 lbs.	**51/–**	**54/–**	**57/–**	**63/–**	**70/–**	**87/–**	**111/–**
Graduated up to 2000 lbs.	**57/–**	**60/–**	**63/–**	**69/–**	**77/–**	**93/–**	**117/–**
Graduated over 2000 lbs.	**60/–**	**63/–**	**66/–**	**72/–**	**80/–**	**96/–**	**120/–**
With Maximum Pointer and lock-up case :							
Graduated 1000 lbs.	**75/–**	**76/–**	**84/–**	**93/–**	**106/–**	**126/–**	—
Graduated 2000 lbs.	**81/–**	**85/–**	**90/–**	**99/–**	**113/–**	**132/–**	—
Graduated over 2000 lbs.	**84/–**	**88/–**	**93/–**	**102/–**	**120/–**	**135/–**	—

Fig. 5073. TRACTION ENGINE.

Eccentric movement. Specially constructed to withstand severe road vibration.

Diameter of dial, inches	3	4	5	6	7
Price each	**28/10**	**31/6**	**34/3**	**37/10**	**43/2**

Fig. 5074. OXY-ACETYLENE WELDING PRESSURE GAUGES.

				Each
High Pressure	0—200 atmosphere per square inch.	Diam., $2\frac{1}{2}''$.	Screwed $\frac{1}{8}''$ pipe thread	**24/–**
Low Pressure	0—250 lbs. per square inch.	Diam., $2\frac{1}{2}''$.	Screwed $\frac{1}{8}''$,, ,, ...	**18/–**

The following Gauges also supplied :

Altitude. **Bottling Machinery.** **Diaphragm Gauges.** **Ammonia.** **Automobile Gauges, etc.**

Prices upon application.

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GAUGE GLASSES & LUBRICATORS.

Fig. 5080. WATER GAUGE GLASSES WITH FUSED OR GROUND ENDS.

Prices per dozen.

Length ...	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
½″ diam.	3/–	3/4	3/9	4/2	4/6	4/10	5/3	5/8	6/–	6/4	6/9	7/2	7/6	7/10	8/3	8/8	9/–
9/16″ ,, ...	3/8	4/2	4/8	5/–	5/6	6/–	6/6	6/10	7/4	7/10	8/3	8/9	9/2	9/8	10/–	10/6	11/–
⅝″ ,, ...	4/–	4/6	5/–	5/6	6/–	6/6	7/–	7/6	8/–	8/6	9/–	9/6	10/–	10/6	11/–	11/6	12/–
11/16″ ,, ...	4/8	5/3	5/10	6/6	7/–	7/6	8/2	8/9	9/4	10/–	10/6	11/–	11/8	12/3	12/10	13/6	14/–
¾″ ,, ...	5/–	5/8	6/3	6/10	7/6	8/2	8/9	9/4	10/–	10/8	11/3	11/10	12/6	13/2	13/9	14/4	15/–
13/16″ ,, ...	6/–	6/9	7/6	8/3	9/–	9/9	10/6	11/3	12/–	12/9	13/6	14/3	15/–	15/9	16/6	17/3	18/–
⅞″ ,, ...	6/8	7/6	8/4	9/2	10/–	10/10	11/8	12/6	13/4	14/2	15/–	15/10	16/8	17/6	18/4	19/2	20/–
15/16″ ,, ...	7/4	8/3	9/2	10/–	11/–	12/–	12/10	13/9	14/8	15/6	16/6	17/6	18/4	19/3	20/2	21/–	22/–
1″ ,, ...	8/–	9/–	10/–	11/–	12/–	13/–	14/–	15/–	16/–	17/–	18/–	19/–	20/–	21/–	22/–	23/–	24/–
1⅛″ ,, ...	10/8	12/–	13/4	14/8	16/–	17/4	18/8	20/–	21/4	22/8	24/–	25/4	26/8	28/–	29/4	30/8	32/–
1¼″ ,, ...	13/4	15/–	16/8	18/4	20/–	21/8	23/4	25/–	26/8	28/4	30/–	31/8	33/4	35/–	36/8	38/4	40/–
1⅜″ ,, ...	18/8	21/–	23/4	25/8	28/–	30/4	32/8	35/–	37/4	39/8	42/–	44/4	46/8	49/–	51/4	53/8	56/–
1½″ ,, ...	24/–	27/–	30/–	33/–	36/–	39/–	42/–	45/–	48/–	51/–	54/–	57/–	60/–	63/–	66/–	69/–	72/–

Fig. 5081. PATENT RED STRIPE AND WHITE ENAMELLED MAGNIFYING WATER GAUGE GLASSES.
With Fused Ends.

Prices per dozen.

Length, inches	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
½″ diam.	8/–	9/–	10/–	11/–	12/–	13/–	14/–	15/–	16/–	17/–	18/–	19/–	20/–	21/–	22/–	23/–	24/–
⅝″ ,, ...	9/–	10/6	11/8	12/10	14/–	15/2	16/4	17/6	18/8	19/10	21/–	22/2	23/4	24/6	25/8	26/10	28/–
¾″ ,, ...	12/–	13/6	15/–	16/6	18/–	19/6	21/–	22/6	24/–	25/6	27/–	28/6	30/–	31/6	33/–	34/6	36/–
⅞″ ,, ...	16/–	18/–	20/–	22/–	24/–	26/–	28/–	30/–	32/–	34/–	36/–	38/–	40/–	42/–	44/–	46/–	48/–
1″ ,, ...	20/–	22/6	25/–	27/6	30/–	32/6	35/–	37/6	40/–	42/6	45/–	47/6	50/–	52/6	55/–	57/6	60/–

Fig. 5082. BEST QUALITY RUBBER GAUGE GLASS RINGS.

Round	...	...	...	...	...	½″	7/6	...	⅝″	9/–	...	¾″	11/–	...	1″	15/–	per gross
Square	...	...	...	...	...	½″	11/–	...	⅝″	13/6	...	¾″	16/6	...	1″	22/6	,,
Hexagon	...	...	...	...	...	½″	25/–	...	⅝″	32/–	...	¾″	40/–	...	1″	48/–	,,

Fig. 5083.

AUTOMATIC DROP SIGHT FEED LUBRICATORS.

Diameter of glass, inches ...	1⅞	2⅛	2¾	2¾	3	3⅜	3¾	4⅜
Capacity of fluid, ozs.	1½	2¼	4	5½	8	11	17	34
Screwed pipe thread, inches ...	⅜	⅜	⅜	½	½	¾	¾	1
Fig. 5083. Per dozen	68/–	74/–	80/–	96/–	114/–	140/–	156/–	288/–
Fig. 5084. Per dozen	61/–	67/–	72/–	87/-	103/–	126/–	—	—

Fig. 5084.

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IMPROVED STAMPED

SEAMLESS STEEL ELEVATOR BUCKETS.

Type A.—Long Back Shallow Bucket. For Grain, Flour, Meal, Starch, Sugar, Coal, or soft and sticky substances.

Type B.—For Clay, Flour, Cement, Wet Sand, and sticky materials. Also for Grain, Seeds, Beans, Peas, etc.

Galvanising extra.

Fig. 5090. Type A.

Fig. 5091. Type B.

TYPE A.

List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.	List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.
A 98	4	3⅝	2⅛	16	2⅞	–/**6**	A 34	8	5¼	3⅜	16	4	**1**/–
A 2	3	4	2¼	18	3	–/**5**	A 37	9	5¼	3⅜	16	4	**1/1**
A 5	3½	4	2¼	18	3	–/**5½**	A 40	10	5¼	3⅜	16	4	**1/2**
A 8	4	4	2¼	18	3	–/**6**	A 43	5	5¾	3½	16	4½	–/**10**
A 11	5	4	2¼	18	3	–/**6½**	A 84	6	5¾	3½	16	4½	–/**10½**
A 13	6	4	2¼	18	3	–/**8**	A 49	7	5¾	3½	16	4½	–/**11½**
A 75	4	4½	2	18	2¾	–/**7**	A 53	8	5¾	3½	14	4½	**1/2**
A 77	5	4½	2	18	2¾	–/**7¼**	A 58	9	5¾	3½	13	4½	**1/5**
A 16	4	4½	2¾	18	3½	–/**7**	A 62	10	5¾	3½	12	4½	**1/9**
A 18	5	4½	2¾	18	3½	–/**7¼**	A 66	8	7½	4¾	12	5½	**2/3**
A 21	6	4½	2¾	16	3½	–/**9½**	A 68	10	7½	4¾	13	5¾	**2/2**
A 24	7	4½	2¾	16	3½	–/**10½**	A 92	9	8½	4¾	14	6¼	**3**/–
A 27	5	5¼	3⅛	16	4	–/**8½**	A 71	12	8½	6	12	6¼	**3/9**
A 30	6	5¼	3⅛	16	4	–/**10**	A 93	13	9	4¾	12	6⅝	**6/6**
A 32	7	5¼	3⅛	16	4	–/**10½**							

TYPE B.

List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.	List No.	Length of Bucket. in.	Breadth of Bucket. in.	Deprh of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.
B 2	3	2	1¼	18	1¾	–/**4**	B 136	9	4¼	2¾	14	3¾	**1**/–
B 367	3½	2	1¼	20	1¾	–/**3¼**	B 139	4¾	5	3⅛	16	4½	–/**6½**
B 5	4	2	1¼	18	1¾	–/**4½**	B 143	5½	5	3⅛	16	4½	–/**7**
B 7	4½	2	1¼	18	1¾	–/**4½**	B 147	6	5	3⅛	16	4½	–/**7½**
B 10	2½	2¼	1⅝	18	2	–/**4½**	B 151	7	5	3⅛	16	4½	–/**8**
B 13	4½	2¾	1½	18	2¼	–/**5**	B 155	8	5	3⅛	16	4½	–/**9**
B 16	5	2¾	1½	18	2¼	—**6½**	B 159	9	5	3⅛	16	4½	–/**10**
B 18	3	3	2	18	2¾	–/**4½**	B 163	10	5	3⅛	16	4½	–/**11**
B 21	4¾	3	2	18	2¾	–/**5**	B 167	5	5¼	3¼	16	4¾	–/**8**
B 24	4½	3	2	18	2¾	–/**5½**	B 171	5½	5¼	3¼	16	4¾	–/**8½**
B 28	14	2¾	2½	16	2⅝	**1/3**	B 175	6	5¼	3¼	16	4¾	–/**10**
B 32	15	3	2	14	2¾	**1/3**	B 179	6½	5¼	3¼	16	4¾	–/**10½**
B 346	3	3½	2	16	3	–/**5**	B 183	7	5¼	3¼	16	4¾	–/**9**
B 349	3½	3½	2	16	3	–/**5**	B 187	7½	5¼	3¼	16	4¾	–/**9**
B 350	5	3½	2¼	16	3	–/**6**	B 191	8	5¼	3¼	16	4¾	–/**10**
B 39	4	3¾	2¼	16	3⅜	–/**5**	B 195	8½	5¼	3¼	16	5¾	–/**11**
B 42	4½	3¾	2¼	16	3⅜	–/**6**	B 199	9	5¼	3¼	16	4¾	–/**10**
B 45	5	3¾	2¼	16	3⅜	–/**6**	B 204	10	5¼	3¼	14	4¾	**1/2**
B 50	5¾	3¾	2¼	16	3⅜	–/**6½**	B 208	15	5¼	3¼	14	4¾	**1/9**
B 55	6	3¾	2¼	16	3⅜	–/**6½**	B 211	7	5½	3¼	16	5	–/**9**
B 59	4½	4	2½	18	3½	–/**5**	B 215	7½	5½	3¼	16	5	–/**10**
B 63	5	4	2½	18	3½	–/**5½**	B 219	8	5½	3¼	16	5	–/**9½**
B 66	5½	4	2½	18	3½	–/**6**	B 223	8½	5½	3¼	16	5	–/**10**
B 71	6	4	2½	16	3½	–/**7**	B 228	9	5½	3¼	14	5	**1/1**
B 76	6½	4	2½	16	3½	–/**7½**	B 233	9½	5½	3¼	14	5	**1/1½**
B 81	7	4	2½	16	3½	–/**8**	B 237	10	5½	3¼	14	5	**1/2**
B 86	8	4	2½	16	3½	–/**9**	B 241	11	5½	3¼	14	5	**1/3**
B 92	9	4	2½	14	3½	**1**/–	B 245	12	5½	3¼	14	5	**1/5**
B 95	4	4¼	2¾	18	3¾	–/**6**	B 248	6	6	3½	16	5¼	–/**10**
B 100	4½	4¼	2¾	18	3¾	–/**6**	B 253	7	6	3½	16	5¼	–/**11½**
B 104	5	4¼	2¾	18	3¾	–/**6**	B 258	8	6	3½	16	5¼	**1/1**
B 109	5½	4¼	2¾	18	3¾	–/**6**	B 264	9	6	3½	14	5¼	**1/4**
B 115	6	4¼	2¾	16	3¾	–/**7½**	B 269	10	6	3½	14	5¼	**1/5**
B 120	6½	4¼	2¾	16	3¾	–/**7½**	B 279	12	6	3½	14	5¼	**1/7**
B 125	7	4¼	2¾	16	3¾	–/**8½**	B 306	15	6¾	4¼	18	6	**2/6**
B 130	8	4¼	2¾	16	3¾	–/**9½**	B 343	24	15	8¼	¼in.	13	**18**/–

The above sizes can be made in various gauges. Quotations for any-sizes not listed can be given.

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IMPROVED STAMPED SEAMLESS STEEL ELEVATOR BUCKETS.

Type C.—Medium Depth Bucket.

Type D.—Deep Bucket. For Grain, Malt, Seeds, Slag, Cinders, Coal, Coke, Cement, Lime, Sand, Ores, Broken Stones, etc.

Galvanising extra.

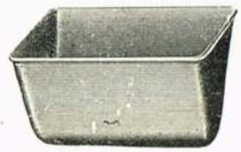

Fig. 5092. Type C.

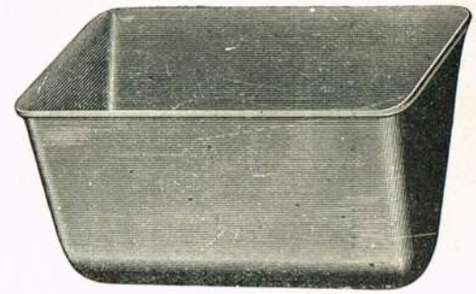

Fig. 5093. Type D.

TYPE C.

List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.
C 223	3½	2¼	2	20	2	**–/5**
C 224	4¼	2¼	2¼	20	2⅛	**–/6**
C 2	14	2¾	2½	18	2⅝	**1/4**
C 5	15½	2¾	2½	18	2⅝	**1/6**
C 8	3	3½	2¾	18	3	**–/6½**
C 225	3½	3½	2¾	20	3	**–/6**
C 12	4	3½	2¾	18	3	**–/7½**
C 16	5	3½	2¾	18	3	**–/8**
C 21	6	3½	2¾	18	3	**–/9**
C 186	3	4	3	18	3⅜	**–/7**
C 187	4,	4	3	18	3⅜	**–/8**
C 26	4	4	3¼	16	3½	**–/9**
C 31	5	4	3¼	16	3½	**–/10**
C 36	6	4	3¼	16	3½	**–/11**
C 41	7	4	3¼	16	3½	**1/–**
C 46	8	4	3¼	16	3½	**1/1**
C 51	9	4	3¼	16	3½	**1/3**
C 56	10	4	3¼	16	3½	**1/6**
C 61	4	4¼	3¼	16	3⅝	**–/9**
C 191	4½	4¼	3¼	16	3⅝	**–/10**
C 66	5	4¼	3¼	16	3⅝	**–/10**
C 194	5½	4¼	3¼	16	3⅝	**–/11**
C 71	6	4¼	3¼	16	3⅝	**–/11**
C 76	7	4¼	3¼	16	3⅝	**1/–**
C 81	8	4¼	3¼	16	3⅝	**1/1**
C 86	9	4¼	3¼	16	3⅝	**1/3**
C 91	10	4¼	3¼	16	3⅝	**1/6**
C 94	11	4⅜	3⅝	16	3¾	**1/9**

List No.	Lenght of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.
C 99	5	4⅝	3¾	16	4	**–/11**
C 104	6	4⅝	3¾	16	4	**1/1**
C 109	7	4⅝	3¾	16	4	**1/2**
C 114	8	4⅝	3¾	16	4	**1/4**
C 119	9	4⅝	3¾	16	4	**1/6**
C 197	5¾	5	3¾	20	4¼	**–/11**
C 198	5¾	5	3¾	18	4¼	**1/–**
C 199	7½	5	3¾	18	4¼	**1/2**
C 201	8	5¼	3¾	18	4⅜	**1/5**
C 204	9	5¼	3¾	18	4½	**1/7**
C 124	5	5¼	4¼	16	4½	**1/–**
C 129	6	5¼	4¼	16	4½	**1/4**
C 135	7	5¼	4¼	16	4½	**1/5**
C 141	8	5¼	4¼	16	4½	**1/7**
C 147	9	5¼	4¼	16	4½	**1/9**
C 154	10	5¼	4¼	16	4½	**2/–**
C 228	11	6	4⅝	16	5¼	**2/4**
C 158	6	6	5	16	5⅜	**1/4**
C 162	7	6	5	16	5⅜	**1/6**
C 166	8	6	5	16	5⅜	**1/8**
C 170	9	6	5	16	5⅜	**1/10**
C 174	10	6	5	16	5⅜	**2/3**
C 180	11	6	5	14	5⅜	**3/–**
C 184	12	6	5	14	5⅜	**3/6**
C 222	8	6¼	5	16	5⅜	**1/8**
C 214	16	6¾	7	10	6½	**8/6**
C 230	14	7½	6	14	7	**5/6**
C 220	12	7¾	6⅞	12	7⅛	**4/9**

TYPE D.

List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.
D 133	3	3	2¾	18	2¾	**–/6½**
D 1	3½	3½	3	19	3⅛	**–/6½**
D 134	4½	4	3½	18	3½	**1/–**
D 135	5	4	3½	18	3½	**1/1**
D 7	6	4½	4	17	3⅞	**1/4**
D 149	5¼	4¾	4⅜	18	3¾	**1/3**
D 151	6	5	4½	18	4¼	**1/7**
D 10	7	5	4¼	16	4⅜	**1/6**
D 15	7	5	4¾	16	4½	**1/6**
D 152	6¾	5⅜	4¼	18	4⅜	**1/4**
D 22	8	5½	5	15	4⅞	**1/9**
D 24	7½	5½	5	16	4½	**1/8**
D 27	8	5¾	4⅞	14	4¾	**2/–**
D 31	9	6	5	16	5⅛	**1/10**
D 40	8½	6½	5¼	16	5¼	**1/10**
D 43	10	6½	5½	18	5½	**2/–**
D 51	9	7	6	18	6	**1/7**
D 55	9	7	6	10	6	**3/–**
D 57	10	7	6	16	6	**2/4**
D 61	10	7	6	10	6	**4/6**
D 62	11	7	6	14	6	**3/–**
D 64	11	7	6	10	6	**4/6**
D 67	12	7	6	14	6	**3/9**
D 70	12	7	6	3/16 in.	6	**7/–**
D 75	12	7½	6	10	6½	**4/6**

List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.
D 77	12	7	6	¼ in.	6½	**8/–**
D 82	12	7½	7	3/16 in.	6½	**8/–**
D 87	12	8	6½	3/16 in.	6¾	**7/–**
D 89	13	8	6	16	6¾	**5/–**
D 91	13	8	6	11	6¾	**6/6**
D 92	14	8½	6	16	7	**5/6**
D 94	14	8½	6	11	7	**7/–**
D 95	14	8½	6½	14	7	**6/6**
D 87	14	8½	6½	3/16 in.	7	**9/–**
D 98	15	8	6½	16	6¾	**5/6**
D 101	15	8	6½	3/16 in.	6¾	**9/–**
D 104	15	8½	6½	16	7	**6/–**
D 107	15	8½	6½	10	7	**8/–**
D 141	15	8½	6½	¼ in.	7	**14/–**
D 110	12½	8¼	7¾	3/16 in.	7	**12/–**
D 113	13	8¼	7¾	3/16 in.	7¼	**12/6**
D 116	18	8½	7¾	16	7½	**10/–**
D 118	18	8½	7¾	10	7½	**12/–**
D 120	18	8½	7¾	3/16 in.	7½	**18/–**
D 122	20	9	8	10	8	**15/–**
D 124	24	9	8	12	8	**15/–**
D 126	24	9	8	3/16 in.	8	**26/–**
D 128	20	10½	8	10	8¼	**16/–**
D 144	24	10½	8	14	8¼	**16/–**
D 132	24	10½	8	3/16 in.	8¼	**28/–**

The above sizes can be made in various gauges. Quotations for any size not listed can be given. Nos. D110 and D113 have bellied fronts.

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IMPROVED STAMPED SEAMLESS STEEL ELEVATOR BUCKETS.

Fig. 5094. Type E.

Type E.—With equal sides for Clay, Sugar, Cement, or any sticky substance.

Type F.—Angle Back Bucket, for Liquids, Ice, Coal, Sewage, etc.

Galvanising extra.

Fig. 5095. Type F.

TYPE E.

List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.	List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.
E 2	3	3	1⅞	18	2⅞	–/**4½**	E 43	10	4	2⅝	16	4	–/**11**
E 5	4½	3	2	18	3	–/**4½**	E 45	10	4	2⅝	11	4	**1/4**
E 8	4	3¾	2¼	18	3¾	–/**4½**	E 47	5½	4⅜	2⅝	16	4¼	–/**6½**
E 11	4½	3¾	2¼	18	3¾	–/**5**	E 49	5½	4⅜	2⅝	11	4¼	**1/–**
E 14	5	3¾	2⅜	18	3¾	–/**5½**	E 51	5¾	4¾	2⅞	16	4½	–/**7**
E 17	7	3¾	2⅜	18	3¾	–/**7½**	E 53	5¾	4¾	2⅞	11	4½	**1/–**
E 20	4½	4	2⅜	18	4	–/**5**	E 54	6	5	3	18	4⅞	–/**7**
E 22	5	4	2⅜	18	4	–/**5½**	E 56	6	5	3	14	4⅞	–/**9**
E 24	5	4	2⅜	14	4	–/**8**	E 74	6	5	3	10	4⅞	**1/3**
E 26	6	4	2⅜	18	4	–/**6½**	E 59	8	5	3	16	4⅞	–/**9**
E 28	6	4	2⅜	14	4	–/**8½**	E 61	8	5	3	11	4⅞	**1/3**
E 30	7	4	2⅜	18	4	–/**7½**	E 63	9	5	3⅛	16	5	–/**10**
E 32	7	4	2⅜	14	4	–/**9**	E 65	9	5	3⅛	11	5	**1/4**
E 35	8	4	2⅜	16	4	–/**9**	E 77	12	5	3⅛	14	5	**2/3**
E 37	9	4	2⅜	11	4	**1**/–	E 67	6½	5¼	3⅛	16	5	–/**8½**
E 39	9	4	2½	16	4	–/**10**	E 69	6½	5¼	3⅛	11	5	**1/2**
E 41	9	4	2½	11	4	**1/3**	E 73	8	5½	3⅛	16	5	–/**9**

TYPE F.

List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.	List No.	Length of Bucket. in.	Breadth of Bucket. in.	Depth of Bucket. in.	Gauge.	Projection from Belt. in.	**Price** each Black Steel.
F 1	5	4	4¼	16	4	**1/4**	F 11	9	5½	5¾	16	5½	**2**/–
F 2	5	4	4¼	14	4	**1/6**	F 12	9	5½	5¾	14	5½	**2/4**
F 20	5	4	4¼	12	4	**1/9**	F 13	9	5½	5¾	11	5½	**3**/–
F 21	5	4	4¼	11	4	**2**/–	F 14	10	6	6¼	13	5⅞	**2/9**
F 3	6	4½	4½	16	4½	**1/6**	F 15	10	6	6¼	11	5⅞	**3/3**
F 4	6	4½	4½	14	4½	**1/8**	F 30	9	6	7¾	11	6⅛	**6**/–
F 22	6	4½	4½	12	4½	**2**/–	F 24	12	6¾	7	16	6⅝	**3/6**
F 23	6	4½	4½	11	4½	**2/3**	F 16	12	6¾	7	14	6⅝	**4**/–
F 5	7	4¾	5	16	4⅝	**1/9**	F 17	12	6¾	7	11	6⅝	**4/9**
F 6	7	4¾	5	14	4⅝	**2**/–	F 29	12	6¾	7	9	6⅝	**5/6**
F 27	7	4¾	5	11	4⅝	**3**/–	F 18	15	6¾	7	14	6⅝	**5/6**
F 7	8	5⅛	5¼	14	5	**2**/–	F 19	15	6¾	7	10	6⅝	**6/6**
F 8	8	5⅛	5¼	12	5	**2/6**	F 26	15¾	6¾	7	11	6⅝	**8/6**
F 9	8	5⅛	5¼	11	5	**4**/–	F 25	18	7½	8	11	7⅛	**12**/–
F 10	8	5⅛	5¼	3/16 in.	5	**6**/–	F 28	18	8½	8¼	11	8	**15**/–

The above sizes can be made in various gauges. Quotations for any sizes not listed can be given.

Steel Conveyor Trays. Made so as to overlap each other, thus forming a continuous travelling trough. Prices on application.

Pressed Steel Gravity Conveyor Buckets. With Flat or Round Bottoms, with or without Lips. Prices on application.

Thrashing Machine Buckets. Elevator Bolts and Nuts. Prices on application.

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SPANNERS. EYE-BOLTS.

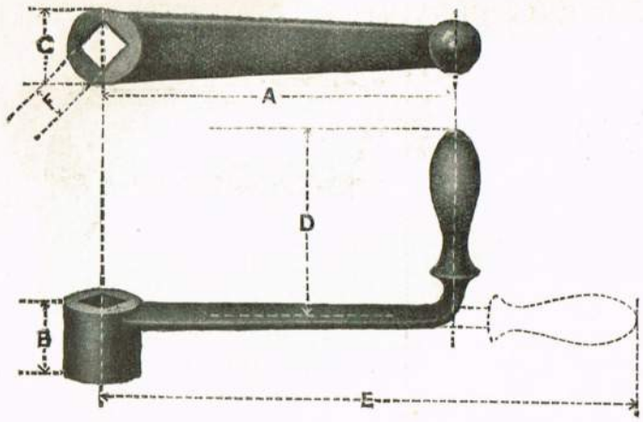

Fig. 5101.

Fig. 5102.

Fig. 5100. DROP-FORGED STEEL UNBREAKABLE MACHINE TOOL HANDLES.

Size of lathe	Position of handle	Shape number	A	B	C	D	E	F	Bright all over Hole, Broached and recessed Per doz.	Per doz. sets
5½	Compound	1	1½	1	7/8	2⅛		½	30/–	
	Cross feed	2	2	1¼	1	2½		½	36/–	
	Length feed	3	3¼	1¼	1⅛	2½		9/16	40/–	147/–
	Nut box	5 (straight)		1½	1 3/16		6¾	9/16	41/–	
6½	Compound	1	1½	1	7/8	2⅛		½	30/–	
	Cross feed	2	2	1¼	1	2½		½	36/–	
	Length feed	3	3¼	1¼	1⅛	2½		9/16	40/–	147/–
	Nut box	5 (straight)		1½	1 3/16		6¾	9/16	41/–	
7½	Compound	1	1½	1	7/8	2⅛		½	30/–	
	Cross feed	4	2½	1⅜	1⅛	2½		9/16	38/–	
	Length feed	5	4	1½	1 3/16	2¾		9/16	42/–	161/–
	Nut box	7 (straight)		1½	1⅜		8⅜	11/16	51/–	
8½	Compound	2	2	1¼	1	2½		½	36/–	
	Cross feed	6	2¾	1½	2	3⅛		1¼	64/–	
	Length feed	7	4¾	1½	1⅜	3⅝		11/16	52/–	203/–
	Nut box	7 (straight)		1½	1⅜		8⅜	11/16	51/–	
9½	Compound	8	2⅝	1 5/16	1⅛	2½		9/16	38/–	
	Cross feed	6	2¾	1½	2	3⅛		1¼	64/–	
	Length feed	7	4¾	1½	1⅜	3⅝		11/16	52/–	208/–
	Nut box	11		1½	1⅜		10	11/16	54/–	
10½	Compound	3	3¼	1¼	1⅛	2½		9/16	40/–	
	Cross feed	9	3¾	1½	2	3½		1¼	68/–	
	Length feed	10	6¼	1½	1⅜	3⅝		11/16	56/–	218/–
	Nut box	11		1½	1⅜		10	11/16	54/–	
12½	Compound	3	3¼	1¼	1⅛	2½		9/16	40/–	
	Cross feed	9	3¾	1½	2	3½		1¼	68/–	
	Length feed	10	6¼	1½	1⅜	3⅝		11/16	56/–	218/–
	Nut box	11		1½	1⅜		10	11/16	54/–	

DROP-FORGED NIPPLE SPANNERS.

Diameter	Our number	Extreme length about	Price per doz. Forgings only
1	3904	6⅛	2/6
1¼	4617	6¾	3/–
1⅜	3902	7¼	3/6
1½	3901	7½	4/–
1⅝	3900	7½	4/3
1¾, 1⅞, 2	3903	7	3/–
2⅛, 2¼, 2⅜	3899	8	5/–
2½, 2⅝, 2¾	4618	8½	6/–
2⅞, 3, 3⅛	3898	9½	7/–
3¼, 3⅜, 3½	3896	10¼	8/6
3⅝, 3¾, 3⅞	3897	11¼	10/–
4, 4⅛, 4¼	4355	11⅞	11/–

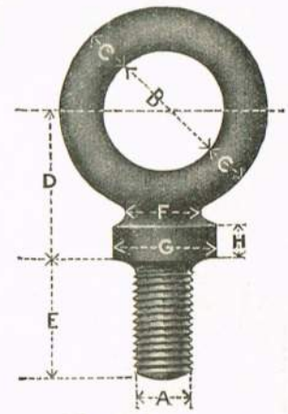

Fig. 5103. Type B.

Fig. 5103. DROP-FORGED DYNAMO EYE-BOLTS. Specially Heat-treated.

Pattern No.	A	B	C	D	E	F	G	H	Price per dozen. Drop-forging only Type A	Screwed and faced. Type A.
2076	⅜	⅞	⅜	1 1/16	¾	⅝	¾	¼	3/–	4/6
2592	½	1⅛	⅜	1⅜	⅞	11/16	1	5/16	4/–	5/–
1644	⅝	1¼	½	1⅝	1	¾	1⅛	⅜	5/6	7/–
1645	¾	1⅝	⅝	2⅛	1¼	1	1⅜	7/16	8/6	10/6
2593	⅞	1¾	⅝	2¼	1⅝	1 1/16	1½	½	11/6	13/–
1646	1	2	¾	2½	1¾	1⅛	1⅝	½	15/6	18/–
1647A	1⅛	2⅜	1	3	2	1⅜	2	⅝	25/–	28/–
1647	1¼	2⅜	1	3	2	1⅜	2	⅝	25/–	28/–
1648A	1⅜	3	1⅛	3½	2¼	1¾	2¼	11/16	42/–	48/–
1648	1½	3	1⅛	3½	2¼	1¾	2¼	11/16	42/–	48/–
1649	1¾	3½	1¼	3⅞	2¾	2⅛	2⅞	¾	60/–	70/–
2486	2	4	1½	4⅜	3½	2⅜	3¼	⅞	102/–	118/–
6325	3	5	2½	6	5	4	4½	1¼	60/–	84/–

Fig. 5104.

Pattern No.	A	B	C	D	E	F	Approx. weight Drop-forgings only per dozen.	Price per dozen Drop-forging only Type B.	Screwed and faced Type B.
5431	⅜	¾	¼	⅝	⅝	9/16	1 lb.	2/6	3/6
5432	½	1	⅜	⅞	¾	¾	2¾ lbs.	3/3	4/6
5433	⅝	1¼	7/16	1½	1⅛	15/16	5 lbs.	4/6	6/–
5434	¾	1 7/16	9/16	1 5/16	1 3/16	1⅛	8¼ lbs.	6/6	8/6
5435	⅞	1⅝	⅝	1 9/16	1⅜	1 5/16	12½ lbs.	8/–	10/6
5436	1	2	¾	1¾	1 9/16	1½	20 lbs.	12/–	15/–
5437	1¼	2 7/16	15/16	2⅛	2	1⅞	38½ lbs.	20/–	24/–
5438	1½	3	1⅛	2⅝	2 5/16	2¼	68 lbs.	32/–	37/–
5439	1¾	3	1 5/16	2 13/16	2⅝	2⅝	101 lbs.	46/–	54/–
5440	2	3	1½	2⅞	2⅞	3	138 lbs.	74/–	84/–
5715	2½	4¼	2	4⅛	6	4	360 lbs.	180/–	360/–

N.B.—In order to give the maximum of reliability, all eye-bolts are made in material specially procured for the purpose, and heat-treated.

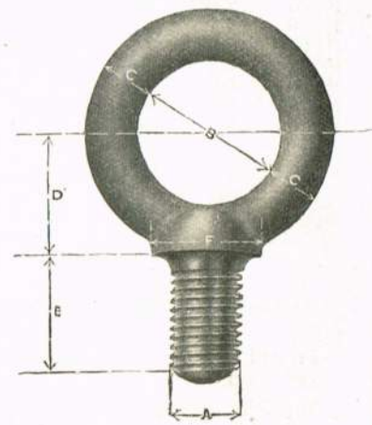

Fig. 5104. Type A.

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COUPLING SCREWS, EYE BOLTS.

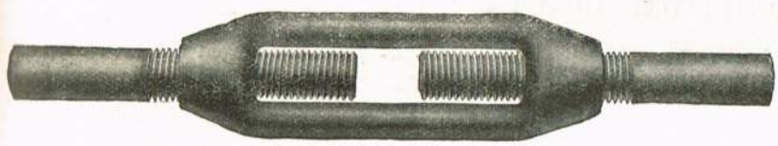

Fig. 5106. DROP-FORGED STEEL COUPLING SCREWS.

Tapped right and left hand. Whitworth thread.

Size, inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Price each—												
Tapped both ends, but without end rods	**8d.**	**10d.**	**1/–**	**1/4**	**1/7**	**1/11**	**2/3**	**2/8**	**3/3**	**3/9**	**5/2**	**6/8**
With end rods for welding	**1/–**	**1/4**	**1/9**	**2/5**	**3/–**	**3/8**	**4/5**	**5/3**	**6/4**	**7/8**	**11/–**	**14/3**

Supplied with openings, 9", 12", 15", 18" or 24". Prices on application.

Fig. 5107. WROUGHT IRON COUPLING SCREW. Fitted with mild steel screw.

Size of screw, inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Price each	**13/3**	**15/3**	**17/3**	**23/–**	**25/3**	**39/–**	**43/9**

Fig. 5108. MALLEABLE CAST IRON HEXAGON COUPLING BOXES.

Tapped. Right and left hand Whitworth thread.

Size, inches	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Length of box, inches	$1\frac{3}{4}$	$2\frac{1}{2}$	3	$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$6\frac{3}{4}$	$7\frac{3}{4}$	$8\frac{1}{2}$	$9\frac{1}{4}$	10	11	12
Price each—														
Without rod ends	**2d.**	**3d.**	**5d.**	**9d.**	**1/–**	**1/4**	**2/1**	**2/7**	**3/3**	**4/6**	**6/3**	**8/–**	**8/8**	**14/–**
With rod ends for welding up	**6d.**	**7d.**	**9d.**	**1/3**	**1/9**	**2/5**	**3/6**	**4/4**	**5/6**	**6/9**	**9/4**	**11/6**	**14/6**	**21/6**

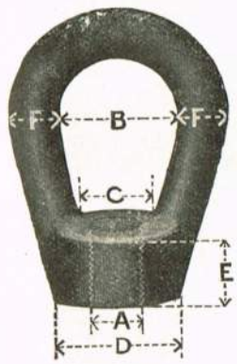

Fig. 5109. DROP-FORGED SPECIAL STEEL HEAT-TREATED EYE-NUTS.

Pattern No.	A Dia. of thread.	B	C	D	E	F	Drop-forgings only, not bored or tapped solid bosses	Bosses tapped Whitworth thread, and faced underneath eyes dressed.
3077	$\frac{1}{4}$ or $\frac{3}{8}$	1	$^{9}/_{16}$	$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{8}$	**4/6** doz.	**6/–** doz.
3232	$\frac{1}{2}$ or $\frac{5}{8}$	$1^{3}/_{16}$	$\frac{5}{8}$	$1\frac{1}{2}$	$^{11}/_{16}$	$\frac{1}{2}$	**7/6** ,,	**9/–** ,,
3829	$\frac{3}{4}$ or $\frac{7}{8}$	$1\frac{5}{8}$	1	$1\frac{3}{4}$	1	$\frac{5}{8}$	**12/–** ,,	**15/–** ,,
3832	1	2	$1^{3}/_{16}$	2	$1\frac{1}{8}$	$\frac{3}{4}$	**18/–** ,,	**24/–** ,,
3004	$1\frac{1}{4}$ or $1\frac{1}{2}$	$2\frac{7}{8}$	$1\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{5}{8}$	$1\frac{1}{8}$	**48/–** ,,	**54/–** ,,

In order to give the maximum of reliability, all Eye-Nuts are made in material specially procured for the purpose, and heat-treated.

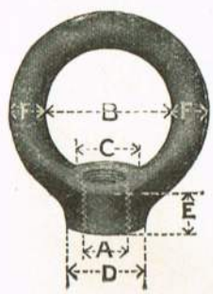

Fig. 5110. DROP-FORGED SPECIAL STEEL HEAT-TREATED EYE-NUTS.

Round Pattern.

Pattern No.	A Dia. of thread.	B	C	D	E	F	Drop-forgings only, not bored or tapped solid bosses	Bosses tapped Whitworth thread, and faced underneath eyes dressed.
2703	$\frac{1}{2}$ or $\frac{5}{8}$	$1\frac{3}{4}$	$\frac{5}{8}$	$1\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	**6/6** doz.	**8/–** doz.
2654	$\frac{3}{4}$ or $\frac{7}{8}$	$1\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$\frac{7}{8}$	$\frac{5}{8}$	**10/6** ,,	**13/6** ,,
2668	1	$2\frac{1}{8}$	1	$1\frac{3}{4}$	$1\frac{3}{8}$	$\frac{5}{8}$	**15/6** ,,	**20/–** ,,

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POINTED IRON WOOD SCREWS

COUNTERSUNK HEADS

Screws with Japanned Heads and Blued Screws charged one price higher. Lath Screws charged **6d.** extra per gross nett.

Per Gross. **ART. No. 1.** **Fig. 5200.**

¼, ⅜ & ½ In.

Wrapped in grosses

No.	s.	d.
1	0	8½
2	0	8½
3	0	8½
4	0	8½
5	0	9
6	0	9½
7	0	11
8	1	0
9	1	1
10	1	2
11	1	3
12	1	4
14	1	10

⅝ Inch.

Wrapped in grosses

No.	s.	d.
2	0	9½
3	0	9½
4	0	9½
5	0	10
6	0	11
7	1	0
8	1	1
9	1	2
10	1	3
11	1	4
12	1	5
14	1	10
16	2	6

¾ Inch.

Wrapped in grosses.

No.	s.	d.
3	0	10
4	0	10
5	0	11
6	1	0
7	1	1
8	1	1½
9	1	2½
10	1	3
11	1	4
12	1	5½
13	1	8
14	1	10
15	2	2
16	2	6
18	3	2

⅞ & 1 Inch

Wrapped in grosses

No.	s.	d.
4	1	0½
5	1	1
6	1	1½
7	1	2½
8	1	3
9	1	3½
10	1	4½
11	1	6½
12	1	7½
13	1	10
14	2	0
15	2	3
16	2	7
17	2	10
18	3	2
20	4	0
22	4	9

1¼ inch.

Wrapped in grosses

No.	s.	d.
5	1	3½
6	1	4
7	1	5
8	1	5½
9	1	6½
10	1	7½
11	1	9
12	1	11
13	2	1
14	2	4
15	2	8
16	3	0
17	3	3
18	3	7
20	4	5
22	5	2
24	5	10

1½ Inch.

Wrapped in grosses

No.	s.	d.
6	1	6
7	1	6½
8	1	7½
9	1	8½
10	1	9
11	1	11
12	2	1
13	2	4
14	2	8
15	3	0
16	3	4
17	3	8
18	4	0
20	4	9
22	5	6
24	6	2
In ½ grosses		
26	7	6
28	8	6
30	10	6

1¾ Inch.

Wrapped in grosses

No.	s.	d.
7	1	10½
8	1	11
9	1	11½
10	2	0
11	2	2
12	2	4
13	2	8
14	3	0
15	3	4
16	3	8
17	4	0
18	4	5
20	5	2
22	5	11
24	6	8
In ½ grosses		
26	8	0
28	10	0
30	12	0
32	15	0

2 Inch.

Wrapped in grosses

No.	s.	d.
8	2	0
9	2	1
10	2	2
11	2	4
12	2	8
13	3	0
14	3	4
15	3	8
16	4	0
17	4	5
18	4	9
20	5	6
22	6	4
24	7	1
In ½ grosses		
26	8	6
28	12	0
30	14	0
32	18	0

2¼ Inch.

Wrapped in grosses

No.	s.	d.
9	2	5
10	2	6
11	2	8
12	3	0
13	3	4
14	3	8
15	4	0
16	4	5
17	4	9
18	5	2
20	5	11
22	6	10
24	8	2
In ½ grosses		
26	9	6
28	12	6
30	16	0
32	20	0

2½ Inch.

Wrapped in grosses

No.	s.	d.
10	2	8
11	3	0
12	3	4
13	3	8
14	4	0
15	4	5
16	4	9
17	5	2
18	5	6
20	6	4
22	7	4
24	8	8
In ½ grosses		
26	10	6
28	13	0
30	18	0
32	22	0

2¾ Inch.

Wrapped in grosses

No.	s.	d.
11	3	4
12	3	8
13	4	0
14	4	5
15	4	9
16	5	2
17	5	9
18	6	6
20	7	6
22	8	8
24	10	4
In ½ grosses		
26	12	0
28	14	0
30	20	0
32	25	0

3 Inch.

Wrapped in grosses

No.	s.	d.
12	4	0
13	4	5
14	4	9
15	5	2
16	5	10
17	6	6
18	7	3
20	8	7
22	10	2
24	11	8
In ½ grosses		
26	13	6
28	15	0
30	20	0
32	26	0
In ½ grosses		
36	38	0
40	46	0

3½ Inch.

Wrapped ingrosses

No.	s.	d.
14	5	10
15	6	6
16	7	2
17	8	0
18	9	0
20	10	8
22	12	4
24	13	8
In ½ grosses		
26	15	6
28	17	6
30	22	0
32	30	0
In ¼ grosses		
40	50	0

4 Inch.

Wrapped in grosses

No.	s.	d.
16	8	1
17	9	0
18	9	10
20	11	6
In ½ grosses		
22	13	0
24	14	4
26	16	6
28	18	6
30	24	0
32	32	0
In ¼ grosses		
36	42	0
40	56	0

4½ Inch.

Wrapped in grosses

No.	s.	d.
16	10	0
18	11	6
20	13	6
In ½ grosses		
22	15	6
24	17	6
26	19	6
28	22	6
30	27	0
32	32	0

5 Inch.

Wrapped in grosses

No.	s.	d.
18	13	6
20	15	6
In ½ grosses		
22	18	0
24	20	0
26	22	0
28	26	0
30	30	0
32	35	0
In ¼ grosses		
40	65	0

5½ Inch.

Wrapped in grosses

No.	s.	d.
18	16	0
20	18	0
In ¼ grosses		
24	22	0

6 Inch.

In ½ grosses

No.	s.	d.
20	20	0
22	22	6
24	25	0
26	30	0
28	35	0
30	40	0
32	45	0

7 Inch.

In ¼ grosses

No.	s.	d.
20	23	9
22	25	0
24	27	6
26	34	0
28	40	0
30	45	0
32	50	0

8 Inch.

In ¼ grosses

No.	s.	d.
20	25	0

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POINTED BRASS WOOD SCREWS

COUNTERSUNK HEADS

Per Gross. **Art. No. 2.** **Fig. 5201.**

¼, ⅜ & ½ Inch.

Wrapped in grosses.

No.	s.	d.
4	1	6
5	1	7
6	1	9
7	2	0
8	2	3
9	2	6
10	2	9
11	3	4
12	3	8

⅝ Inch.

Wrapped in grosses.

No.	s.	d.
4	1	8
5	1	10
6	2	0
7	2	3
8	2	5
9	2	8
10	3	0
11	3	4
12	3	8
14	5	9

¾ Inch.

Wrapped in grosses.

No.	s.	d.
4	1	10
5	2	0
6	2	3
7	2	6
8	2	8
9	3	0
10	3	4
11	3	10
12	4	4
13	4	10
14	5	9
16	7	10

⅞ & 1 Inch.

Wrapped in grosses.

No.	s.	d.
6	2	9
7	3	0
8	3	4
9	3	8
10	4	1
11	4	6
12	5	0
13	5	7
14	6	3
15	7	0
16	7	10
17	8	11
18	10	0
20	12	6

1¼ Inch.

Wrapped in grosses.

No.	s.	d.
6	3	3
7	3	7
8	4	0
9	4	5
10	4	11
11	5	5
12	6	0
13	6	8
14	7	5
15	8	3
16	9	2
17	10	4
18	11	6
20	14	2
In ½ grosses.		
22	17	3

1½ Inch.

Wrapped in grosses.

No.	s.	d.
6	4	0
7	4	4
8	4	8
9	5	2
10	5	9
11	6	4
12	7	0
13	7	9
14	8	7
15	9	6
16	10	6
17	11	9
18	13	0
20	15	10
In ½ grosses.		
22	19	1
24	22	8

1¾ Inch.

Wrapped in grosses.

No.	s.	d.
7	5	3
8	5	6
9	5	11
10	6	7
11	7	3
12	8	0
13	8	10
14	9	9
15	10	9
16	11	10
18	14	6
20	17	6
In ½ grosses.		
22	20	11
24	24	8

2 Inch.

Wrapped in grosses.

No.	s.	d.
8	6	3
9	6	9
10	7	5
11	8	2
12	9	0
13	9	11
14	10	11
15	12	0
16	13	2
17	14	7
18	16	0
20	19	2
In ½ grosses.		
22	22	9
24	26	8
26	32	0
28	38	0
In ½ grosses.		
30	44	0
32	50	0

2¼ Inch.

Wrapped in grosses.

No.	s.	d.
8	7	0
9	7	6
10	8	3
11	9	1
12	10	0
13	11	0
14	12	1
15	13	3
16	14	6
18	17	6
20	20	10
In ½ grosses.		
22	24	7
24	28	8

2½ Inch.

Wrapped in grosses.

No.	s.	d.
10	10	0
11	10	6
12	11	0
13	12	1
14	13	3
15	14	6
16	15	10
17	17	5
18	19	0
20	22	6
In ½ grosses.		
22	26	5
24	30	8
26	36	0
28	44	0
In ½ grosses.		
30	48	0
32	54	0

2¾ Inch.

Wrapped in grosses.

No.	s.	d.
12	13	0
13	13	9
14	14	5
15	15	9
16	17	2
18	20	6
20	24	2
In ½ grosses.		
22	28	3
24	32	8
26	38	0

3 Inch.

Wrapped in grosses.

No.	s.	d.
12	14	6
13	15	0
14	15	7
15	17	0
16	18	6
17	20	3
18	22	0
In ½ grosses.		
20	25	10
22	30	1
24	34	8
26	40	0
In ½ grosses.		
28	50	0
30	60	0
32	70	0

3½ Inch.

Wrapped in grosses.

No.	s.	d.
12	16	6
13	17	3
14	18	0
15	20	0
16	22	0
18	26	0
In ½ grosses.		
20	30	0
22	35	0
24	40	0
In ½ grosses.		
26	45	0
28	55	0
30	65	0
32	77	6

4 Inch.

In ½ grosses.

No.	s.	d.
14	22	6
16	25	0
18	29	0
In ½ grosses.		
20	33	6
22	39	0
24	45	0
26	50	0
28	60	0
30	70	0
32	85	0

4½ Inch.

In ½ grosses.

No.	s.	d.
14	27	0
16	30	0
18	34	0
In ½ grosses.		
20	37	0
22	43	0
24	50	0
28	65	0

5 Inch.

In ½ grosses.

No.	s.	d.
16	34	6
18	37	0
In ½ grosses.		
20	40	6
22	47	0
24	55	0
26	60	0
28	72	0
30	86	0
32	100	0

6 inch.

In ½ grosses.

No.	s.	d.
20	60	0
22	65	0
24	70	0
26	80	0
28	96	0
30	120	0
32	150	0

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POINTED BRASS WOOD SCREWS.

Fig. 5202. Round Heads.

Note.—All Round Head Screws are measured from under the Head.

Per Gross. **Art. No. 2A.**

¼ & ⅜ Inch.
Wrapped in grosses.

No.	s.	d.
4	1	7
5	1	9
6	2	0
7	2	3
8	2	6

½ Inch.
Wrapped in grosses.

No.	s.	d.
4	1	10
5	2	0
6	2	3
7	2	5
8	2	8
9	3	0
10	3	4

⅝ Inch.
Wrapped in grosses.

No.	s.	d.
4	2	0
5	2	3
6	2	6
7	2	8
8	3	0
9	3	4
10	3	10
11	4	4
12	4	10

¾ Inch.
Wrapped in grosses.

No.	s.	d.
4	2	6
5	2	9
6	3	0
7	3	4
8	3	8
9	4	1
10	4	6
11	5	0
12	5	7
14	7	0

⅞ & 1 Inch.
Wrapped in grosses.

No.	s.	d.
6	3	7
7	4	0
8	4	5
9	4	11
10	5	5
11	6	0
12	6	8
13	7	5
14	8	3
15	9	2
16	10	4
18	12	9

1¼ Inch.
Wrapped in grosses.

No.	s.	d.
6	4	4
7	4	8
8	5	2
9	5	9
10	6	4
11	7	0
12	7	9
13	8	7
14	9	6
15	10	6
16	11	9
18	14	3
20	19	0

1½ inch.
Wrapped in grosses.

No.	s.	d.
7	5	6
8	6	0
9	6	6
10	7	3
11	8	0
12	8	9
13	9	9
14	10	9
15	11	9
16	13	3
18	16	0
20	21	0
In ½ grosses.		
22	24	9
24	32	0

1¾ Inch.
Wrapped in grosses.

No.	s.	d.
8	6	9
9	7	6
10	8	3
11	9	0
12	10	0
13	11	0
14	12	0
15	13	3
16	14	6
18	17	6
20	22	9
In ½ grosses.		
22	26	9
24	34	0

2 inch.
Wrapped in grosses.

No.	s.	d.
8	7	6
9	8	3
10	9	0
11	10	0
12	11	0
13	12	0
14	13	3
15	14	6
16	16	0
18	19	0
In ½ grosses.		
20	24	6
22	28	9
24	36	0

2¼ Inch.
Wrapped in grosses.

No.	s.	d.
10	10	6
11	11	0
12	12	0
13	13	3
14	14	6
15	16	0
16	17	6
18	20	9
In ½ grosses.		
20	26	6
22	30	9
24	38	0

2½ Inch.
Wrapped in grosses.

No.	s.	d.
12	13	9
13	14	6
14	15	9
15	17	3
16	18	9
18	22	3
In ½ grosses.		
20	28	3
22	32	9
24	40	0

2¾ Inch.
Wrapped in grosses.

No.	s.	d.
12	15	0
14	17	0
16	20	3
18	24	0

3 Inch.
Wrapped in grosses.

No.	s.	d.
12	17	0
14	20	0
16	24	0
18	28	0
In ½ grosses.		
20	35	0
22	40	0
24	45	0

3½ Inch.
Wrapped in grosses

No.	s.	d.
14	23	6
16	27	0
In ½ grosses.		
18	31	6
20	39	0
22	45	0
In ½ grosses.		
24	50	0

4 Inch.
Wrapped in grosses

No.	s.	d.
14	30	0
16	34	0
In ½ grosses.		
18	37	0
20	43	0

Quotations upon application for Antique Coppered, Coppered Bronzed, Electro Coppered, Copper Oxydised, Oxydised and Electro Silvered.

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BOLTS & NUTS—BLACK.

WHITWORTH THREAD.

Prices per gross.

3/16″ and ¼″ packed in grosses. 5/16″ and ⅜″, in ½-grosses. 7/16″ and ½″ up to 6″ long, in ½-grosses. Larger bolts in ¼-grosses.

Fig. 5209. CUP. SQUARE. SQUARE.

Diam. / Length	3/16″	¼″	5/16″	⅜″	7/16″	½″	⅝″
¾″	5/6	5/8	8/2	—	—	—	—
⅞″	5/6	—	—	—	—	—	—
1″	5/6	5/8	8/2	11/0	—	—	—
1¼″	5/6	5/8	8/2	11/–	—	19/–	30/–
1½″	5/8	5/10	8/2	11/2	13/10	20/6	32/–
1¾″	5/10	6/–	8/6	11/8	14/8	—	34/–
2″	6/–	6/4	8/10	12/–	15/4	20/10	36/–
2¼″	—	6/8	9/2	12/8	—	21/2	36/6
2½″	—	6/10	9/6	13/2	16/6	21/2	37/–
2¾″	—	7/4	10/–	13/10	—	22/2	37/10
3″	—	7/6	10/4	14/–	18/–	23/–	38/10
3¼″	—	7/10	11/–	14/8	—	—	—
3½″	—	8/2	11/4	15/2	19/4	25/4	42/4
4″	—	8/8	12/–	16/2	20/10	27/–	44/2
4½″	—	9/4	12/8	17/2	22/2	28/10	46/10
5″	—	10/–	13/6	18/–	23/6	30/8	50/–
5½″	—	10/10	14/6	19/4	24/4	32/6	53/8
6″	—	11/4	14/10	20/4	25/8	34/4	56/10
6½″	—	—	—	22/6	27/–	36/–	59/–
7″	—	—	—	23/6	28/10	38/4	61/4
7½″	—	—	—	24/8	30/2	40/6	64/4
8″	—	—	—	25/4	31/2	42/4	67/6
8½″	—	—	—	—	—	43/8	—
9″	—	—	—	27/6	35/2	45/–	72/–
10″	—	—	—	29/10	37/10	49/6	77/6
11″	—	—	—	32/6	—	53/2	—
12″	—	—	—	34/8	—	56/10	90/–

Fig. 5210. HEXAGONAL. ROUND. HEXAGONAL.

Diam. / Length	¼″	5/16″	⅜″	7/16″	½″	⅝″
1″	12/2	14/10	18/–	—	—	—
1¼″	12/2	14/10	18/–	—	—	—
1½″	12/2	14/10	18/–	22/4	29/–	42/6
1¾″	13/2	15/6	19/–	23/–	30/–	—
2″	13/4	15/8	19/4	24/–	31/6	46/–
2¼″	13/6	16/6	19/10	24/8	32/–	—
2½″	13/8	16/6	20/6	25/8	33/–	48/10
3″	14/4	17/8	21/10	27/6	35/2	52/4
3½″	15/2	18/6	23/6	29/2	37/8	55/6
4″	15/6	19/6	24/6	30/10	40/–	58/4
4½″	17/–	21/8	26/10	32/6	42/–	61/8
5″	17/8	22/10	28/4	34/10	44/2	65/2
6″	19/–	24/8	30/10	37/10	48/8	71/10
7″	—	—	33/8	41/6	53/–	78/10
8″	—	—	37/–	45/4	58/6	86/4
9″	—	—	39/6	48/6	63/–	93/–
10″	—	—	42/–	52/–	67/–	99/6
12″	—	—	47/6	—	76/6	13/–

Fig. 5211. SET SCREWS (HEXAGON HEAD).

Prices per gross.

Diam. / Length	¼″	5/16″	⅜″	7/16″	½″	⅝″
¾″	9/–	—	—	—	—	—
1″	9/6	10/–	13/–	16/–	—	—
1¼″	10/–	11/–	13/6	17/–	20/–	—
1½″	10/6	12/–	14/–	18/6	21/–	—
1¾″	11/6	—	15/–	—	—	—
2″	12/–	—	16/–	21/–	23/–	42/–
2½″	—	—	18/–	23/–	27/–	46/–
2″	—	—	—	—	—	52/–

Fig. 5212. COACH SCREWS.

Square Chamfered Head.

Prices per gross.

Diam. / Length	¼	5/16″	⅜″	7/16″	½″
1½″	12/4	12/8	14/4	—	—
1¾″	12/8	—	—	—	—
2″	12/8	12/10	15/8	18/8	22/2
2½″	13/6	13/10	17/2	20/4	24/2
3″	14/8	15/–	18/4	22/–	26/4
3½″	—	16/–	20/–	23/10	28/4
4″	—	17/2	21/6	25/10	30/6
4½″	—	—	22/10	27/6	32/8
5″	—	—	24/6	29/8	35/4
6″	—	—	27/6	33/2	39/4

Fig. 5213. TAPPED NUTS.

Prices per gross.

Diam....	¼″	5/16″	⅜″	7/16″	½″	⅝″	¾″
Hexagon ...	4/–	5/–	6/–	7/6	8/6	14/–	20/–
Square	3/4	4/–	5/–	6/–	7/–	11/–	16/–
Wing	10/–	14/6	22/–	34/–	40/–	66/–	—

Fig. 5214. SQUARE. ROUND. SQUARE.

Diam. / Length ...	¼″	5/16″	⅜″	7/16″	½″	⅝″
1″ ...	11/10	14/2	17/4	21/10	—	—
1¼″ ...	11/10	14/2	17/4	21/10	—	—
1½″ ...	11/10	14/2	17/4	21/10	—	—
1¾″ ...	12/6	15/–	18/4	23/4	—	—
2″ ...	12/6	15/–	18/6	23/8	30/4	44/–
2½″ ...	13/–	16/–	19/8	25/–	32/4	48/2
3″ ...	13/6	16/9	20/10	26/8	34/10	51/–
3½″ ...	—	—	22/4	28/4	37/–	54/4
4″ ...	—	—	24/–	30/–	39/–	57/6
4½″ ...	—	—	25/6	31/–	41/4	62/–
5″ ...	—	—	26/8	33/–	43/6	64/–
6″ ...	—	—	29/6	36/–	48/2	70/–

Fig. 5215. IRON WASHERS.

Prices per gross.

	3/16″	¼″	5/16″	⅜″	7/16″	½″	⅝″	¾″	⅞″	1″
For bolts	7d.	7d.	7d.	8d.	9d.	1/–	1/4	2/–	3/2	4/8
Light	—	10d.	1/–	1/2	1/4	1/10	3/–	4/–	5/6	8/–
Heavy										

30 gross or **£10** net value of Bolts and Nuts, Coach Screws and Tapped Nuts carriage paid.
We do not break parcels.

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BRIGHT STEEL BOLTS & NUTS.

BRIGHT STEEL BOLTS AND NUTS.

Fig. 5220. Whitworth Standard Thread.

Ins. ...	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	inches
3/4 ...	8/3	9/10¾	12/7¾	16/2¾	—	—	—	—	—	—	—	per gross.
1 ...	9/4½	9/10¾	12/11	16/6	22/0½	25/3½	—	—	—	—	—	,,
1¼ ...	9/10¾	11/–	13/9	17/0½	23/1¼	26/11½	—	—	—	—	—	,,
1½ ...	11/6½	12/1¼	14/10¼	19/3	24/2½	28/7½	44/–	46/2½	58/10¼	—	—	,,
1¾ ...	12/11	13/2½	16/2¾	21/2	26/1½	30/9½	—	48/4¾	60/6	—	—	,,
2 ...	13/2½	13/5¾	17/0½	22/0½	28/0½	31/10¾	46/9	50/7¼	62/8½	—	—	,,
2¼ ...	—	15/1½	19/9½	24/5¾	29/5	34/1¼	—	51/8½	70/4¾	—	—	,,
2½ ...	—	15/11½	20/7½	25/10¼	30/3	36/0¼	50/4	52/9½	71/6	—	—	,,
2¾ ...	—	17/10½	22/–	26/11½	31/7½	37/8	—	55/–	73/8½	—	—	,,
3 ...	—	19/3	22/10	27/6	33/–	39/4	54/5½	57/9	75/10¾	96/9½	121/–	,,
3¼ ...	—	21/5½	26/1½	29/8½	36/10¼	42/10¾	—	60/6	78/1¼	99/–	127/7¼	,,
3½ ...	—	23/1¼	27/2¾	31/7½	40/1¾	45/1¼	60/6	63/3	79/9	103/4¾	133/1¼	,,
4 ...	—	27/6	28/7¼	35/9	41/6¼	49/6	65/5½	65/5½	83/7¼	110/–	145/2½	,,
4½ ...	—	—	—	—	—	53/10¾	—	67/1¼	88/–	117/8½	151/3	,,
5 ...	—	—	—	41/9½	47/10¼	57/2½	75/10¾	71/6	92/4¾	128/8½	162/10¼	,,
5½ ...	—	—	—	—	—	62/8½	—	75/4¼	96/9½	140/9½	176/–	,,
6 ...	—	—	—	46/2½	53/10¾	63/9½	85/9½	84/8½	103/4¾	159/6	195/9½	,,
8 ...	—	—	—	—	—	77/–	—	—	123/2½	—	—	,,

BRIGHT STEEL BOLTS AND NUTS.

Fig. 5221. (B.S.F.).

Ins. ...	3/4	1	1¼	1½	1¾	2	2¼	2½	3	3½	4	inches.
3/16 ...	7/8½	8/3	8/9½	9/10¾	11/–	11/6½	—	—	—	—	—	per gross.
1/4 ...	—	8/9½	9/7½	10/2	11/6½	12/1¼	13/5¾	14/3½	16/2¾	18/1¾	20/4¼	,,
5/16 ...	—	10/8½	12/1¼	12/7¾	13/2½	14/7	16/6	18/8½	20/10¾	25/0¼	27/6	,,
3/8 ...	—	14/0¼	14/7	15/4¾	16/6	17/4	18/5	19/6¼	22/3¼	26/4¾	30/9½	,,
7/16 ...	—	—	—	19/3	20/10¾	22/–	23/7¾	28/0½	30/9½	34/7¾	39/7½	,,
1/2 ...	—	—	—	24/9	26/11½	28/0½	30/3	31/10¾	37/4¾	41/9½	48/4¾	,,

Fig. 5222. BRIGHT STEEL HEXAGON NUTS.

Per Gross.

Inches ...	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1⅛	1¼	1⅜	1½
Whitworth ...	2/5¾	2/9	3/0¼	3/9	4/4¾	6/10½	7/8½	12/6½	14/0¼	18/8½	28/0½	37/4¾	50/4	61/7¼	85/9½	107/9½
Do. Lock ...	—	—	2/9	3/7	4/4¾	6/7¼	7/5	12/4½	13/9	17/7¼	26/4¾	36/3½	49/–	59/4¾	83/7¼	106/8½
B.S.F. or Whit. Auto... ...	—	2/5¾	2/6¾	2/10	3/10¼	5/10½	6/11½	—	11/–	14/10¼	—	—	—	—	—	—
Slotted Whit.	—	4/11½	5/9¼	6/7¼	8/3	9/10¾	11/3¼	16/6	18/8½	28/0½	39/7¼	52/3	—	—	—	—
Castle Whit.	—	—	8/9½	10/8¾	12/7¾	14/10¼	17/0½	18/8½	23/7¾	34/1¼	42/10¾	62/1¾	—	—	—	—
Slotted B.S.F. and Auto	—	—	5/2¾	6/0½	7/1¾	8/6¼	9/10¾	—	16/6	22/6½	—	—	—	—	—	—
Castle Auto Standard ...	—	—	8/3	9/10¾	12/1¼	13/9	15/4¾	—	21/5½	26/8¼	—	—	—	—	—	—

5% extra for broken grosses.

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SCREWS, STUDS & WASHERS.

BRIGHT STEEL SET SCREWS.

Fig. 5223. Whitworth and B.S.F.

Ins. ...	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	
1/2 ...	5/6	6/7	8/3	10/2	—	—	—	—	per gross.
3/4 ...	6/1	6/10	8/6	11/–	14/10	17/7	—	—	,,
1 ...	6/4	8/3	9/4	11/6	15/8	18/11	33/–	44/–	,,
1 1/4 ...	7/2	8/–	10/2	12/11	17/4	20/4	34/8	46/9	,,
1 1/2 ...	8/–	8/9	11/–	14/–	18/5	22/–	36/4	47/10	,,
1 3/4 ...	8/9	9/7	12/4	15/5	20/11	24/6	38/–	49/6	,,
2 ...	10/2	10/9	13/9	16/6	21/9	27/–	39/7	50/7	,,
2 1/4 ...	—	12/11	15/1	20/4	25/–	29/2	41/3	53/11	,,
2 1/2 ...	—	14/10	17/4	21/6	27/6	30/–	42/11	57/3	,,
2 3/4 ...	—	17/–	—	—	29/2	33/3	—	61/7	,,
3 ...	—	18/8	19/9	25/10	31/1	38/–	46/9	66/r	,,
3 1/2 ...	—	—	—	—	33/6	—	50/7	74/10	,,
4 ...	—	—	—	—	35/2	45/8	55/–	88/–	,,

Fig. 5225. BRIGHT STEEL WHITWORTH STUDS.

Ins. ...	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	
1 ...	4/3	5/3	6/1	—	—	—	—	—	—	—	per gross.
1 1/4 ...	4/7	5/6	6/4	7/9	9/1	—	—	—	—	—	,,
1 1/2 ...	4/10	5/9	7/2	8/3	9/8	—	12/11	—	—	—	,,
1 3/4 ...	5/1	6/1	7/5	8/10	9/11	—	13/6	—	—	—	,,
2 ...	5/6	6/11	7/9	9/4	10/9	—	14/–	19/6	—	—	,,
2 1/4 ...	6/1	7/2	8/6	10/2	11/7	—	14/4	20/8	—	—	,,
2 1/2 ...	6/7	8/–	9/1	11/2	12/1	—	15/5	20/11	25/10	—	,,
2 3/4 ...	7/2	8/3	9/8	12/4	13/3	—	17/1	22/10	28/1	—	,,
3 ...	8/3	8/10	9/11	13/5	13/6	—	18/5	23/1	33/–	45/11	,,
3 1/4 ...	9/1	10/2	10/6	14/6	14/10	—	19/10	25/9	36/4	47/–	,,
3 1/2 ...	9/11	11/–	11/–	15/7	15/5	—	20/11	27/6	37/5	49/3	,,
3 3/4 ...	—	—	12/1	—	16/–	—	22/–	28/4	39/7	50/4	,,
4 ...	—	—	13/3	—	18/5	—	23/1	28/7	41/10	51/5	,,
4 1/2 ...	—	—	14/4	—	19/10	—	24/9	35/3	50/1	57/3	,,
5 ...	—	—	—	—	—	—	27/–	39/7	59/8	62/9	,,
5 1/2 ...	—	—	—	—	—	—	29/2	42/4	63/10	70/5	,,
6 ...	—	—	—	—	—	—	32/6	49/–	73/9	81/5	,,

Fig. 5226. BRIGHT STEEL CHAMFERED WASHERS.

1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	inches.
1/5	1/5	1/5	1/6	2/1	2/11	3/4	5/–	per gross.
5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	inches.
5/2	6/4	12/5	14/–	22/–	24/3	32/6	48/9	per gross.

5% extra for broken grosses.

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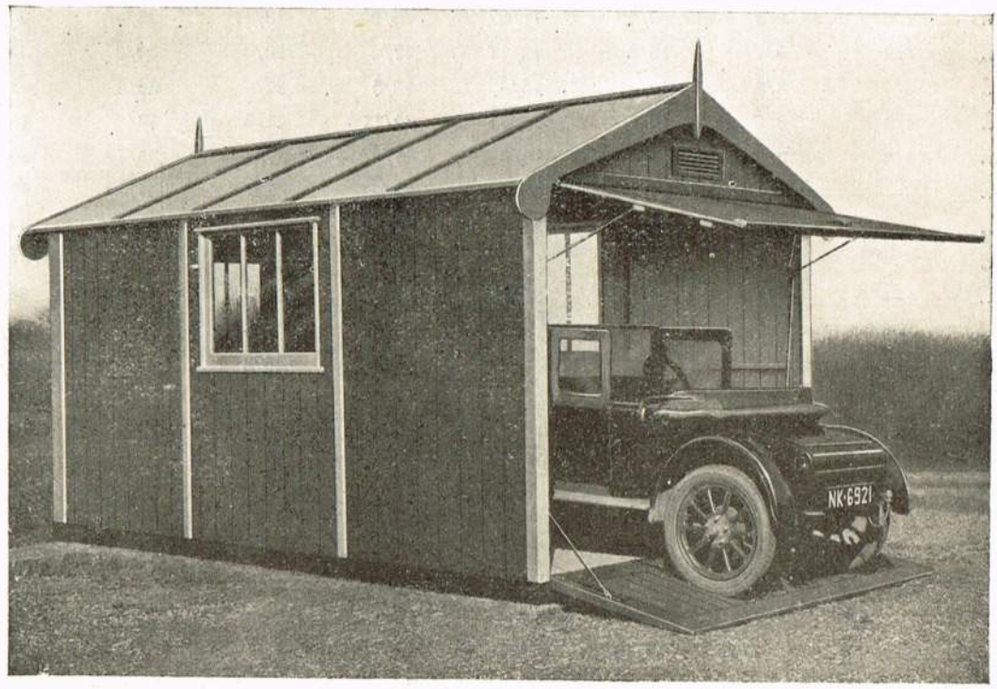
MOTOR HOUSES

Fig. 5300.



" Maxicon " Garage, size 15 ft. x 9 ft. *From a Photograph.*

These garages are very ingeniously made of standardized panels, and are particularly easy to erect. At the same time this method facilitates large-scale production, so that first quality is supplied at a moderate price. The finish throughout is good, all exposed surfaces inside and out being planed smooth and stained. Best timber only is used.

The " Canopy-Door " (seen above) provides shelter for the car when in half-out position, to give extra working space round the engine. The door is counter-balanced : opens and shuts at a touch, and cannot flap in the wind. It also gives a full-width door opening, so that the car may be driven in close to one wall to leave more room, or driven in from a wide angle.

" Maxicon " motor houses are made in 36 sizes, with option of asbestos covering for walls, and Italian iron for roof, to meet local requirements. Full specification and prices on opposite page. It should be noted that these prices include delivery charges, and that such extras as are offered are quite optional, the house at the ordinary price being complete.

Any size can be delivered promptly and can be made to suit customers' specifications.

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MOTOR HOUSES.

GENERAL SPECIFICATION AND PRICE LIST OF MOTOR HOUSES on previous page.

Fig. 5300.

Floor: Joists, 4in. by 2in., eighteen inches apart, covered 1in. tongued and grooved boards. Walls ¾in. tongued and grooved boards on unit frames, 3in. deep. Panel sides, with vertical member forming flitch beams 3in. by 3in. Roof, ¾in. tongued and grooved boards on deep purlins, covered 3-ply Ruberoid or equivalent, fastened with battens and galvanised clouts. The whole impregnated inside and outside with brown preservative stain. All exposed surfaces, inside and out, planed smooth. Two windows per house both made to open. Position of windows optional in assembling. Louvre ventilator in gable.

Variations. To meet special requirements, Italian iron roofing may be had in place of the Ruberoid, and the house may be lined with fireproof asbestos shetlng at extra prices shown below.

DIMENSIONS.	MAXICON MOTOR HOUSE COMPLETE.		ALLOWANCES.			EXTRA.	
All Maxicon Motor Houses are 7 ft. high at eaves.	With wooden floor, two windows and Canopy Door. Stained inside and out with brown preservative stain.	With wooden floor, two windows, but ordinary swing doors and ramp. Stained inside and out with brown preservative stain.	If wooden floor not required (where house is erected upon concrete) deduct	If house delivered without preservative stain (for painting), floor stained as usual, deduct		Fireproof lining. Asbestos sheeting 3/16in., covering walls, door and roof, add	Italian iron covering to roof in place of Ruberoid, add
Ft. Ft.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.
10× 9	29 2 6	26 2 6	4 5 0	1 10 0		9 7 6	2 11 8
10	31 12 6	28 5 0	4 15 0	1 14 0		10 2 6	2 15 0
12	37 0 0	33 0 0	5 15 0	2 1 0		11 12 6	3 0 0
15	45 12 6	40 17 6	7 5 0	2 11 0		13 15 0	3 6 8
12× 9	31 17 6	28 17 6	5 0 0	1 17 0		10 10 0	3 2 0
10	34 12 6	31 5 0	5 10 0	2 1 0		11 5 0	3 6 0
12	40 10 0	36 7 6	6 15 0	2 9 6		13 0 0	3 12 0
15	49 12 6	44 17 6	8 7 6	3 1 0		15 5 0	4 0 0
14× 9	34 15 0	31 15 0	5 15 0	2 2 0		11 15 0	3 12 4
10	37 12 6	34 5 0	6 5 0	2 8 0		12 10 0	3 17 0
12	43 15 0	39 15 0	7 12 6	2 17 0		14 7 6	4 4 0
15	53 15 0	49 0 0	9 12 6	3 12 0		16 15 0	4 13 4
15× 9	36 2 6	33 2 6	6 2 6	2 6 0		12 5 0	3 17 6
10	39 5 0	35 17 6	6 15 0	2 11 6		12 2 6	4 2 6
12	45 10 0	41 10 0	8 2 6	3 1 0		15 17 6	4 10 0
15	55 12 6	50 17 6	10 5 0	3 17 0		17 10 0	5 0 0
18× 9	40 7 6	37 7 6	7 5 0	2 15 6		14 2 6	4 13 0
10	43 12 6	40 5 0	7 17 6	3 1 0		14 17 6	4 19 0
12	50 12 6	46 12 6	9 10 0	3 14 0		17 0 0	5 8 0
15	61 15 0	57 0 0	12 0 0	4 12 6		19 15 0	6 0 0
20× 9	43 5 0	40 5 0	7 17 6	3 1 0		15 5 0	5 3 4
10	46 12 6	43 5 0	8 15 0	3 8 6		16 2 6	5 10 0
12	54 0 0	50 0 0	10 10 0	4 2 0		18 7 6	6 0 0
15	65 15 0	61 0 0	13 5 0	5 3 0		21 5 0	6 13 4
21× 9	44 12 6	41 12 6	8 5 0	3 4 0		15 15 0	5 8 6
10	48 2 6	44 15 0	9 2 6	3 12 0		16 15 0	5 15 6
12	55 15 0	51 15 0	11 0 0	4 6 6		19 0 0	6 6 0
15	67 15 0	63 0 0	13 17 6	5 8 0		21 17 6	7 0 0
24× 9	48 15 0	45 15 0	9 7 6	3 14 0		17 12 6	6 4 0
10	52 15 0	49 5 0	10 5 0	4 2 6		18 10 0	6 12 0
12	60 17 6	56 17 6	12 10 0	4 18 0		21 2 6	7 4 0
15	73 15 0	69 0 0	15 15 0	6 3 6		24 2 6	8 0 0
25× 9	50 5 0	47 5 0	9 15 0	3 17 0		18 2 6	6 9 2
10	54 5 0	50 15 0	10 15 0	4 5 6		19 5 0	6 17 6
12	62 12 6	58 12 6	13 0 0	5 1 0		21 15 0	7 10 0
15	75 15 0	71 0 0	16 5 0	6 9 0		24 17 6	8 6 8

OPTIONAL EXTRAS:

Additional Windows	25/– each	
Additional Small Door	25/– ,,	
Bench	15/– ,,	If ordered with house.
Drip Tray and Car Stops	12/6 per set	
Wheel Stand	5/– each	

FOREMAN'S AND WORKMAN'S HUTS made in the shortest notice. Usual delivery about three to four days.

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SCISSORS.

COMPTON CELEBRATED AMERICAN TAILORS' SHEARS AND TRIMMERS.

Fully Guaranteed.

ig. 5400. Best Quality ffield Embroidery Scissors.

4½″ long.

Price **35**/– per dozen.

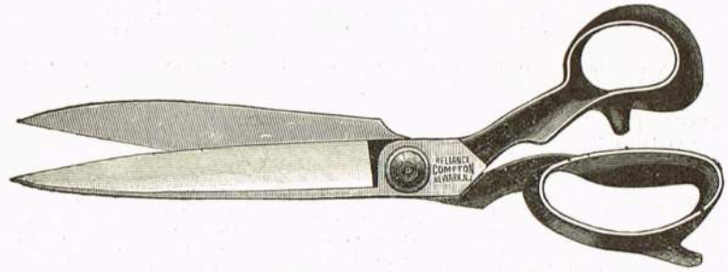

Fig. 5403. Light Pattern Tailors' Shears with brass screws.

No.	A.	B.	C.	D.
Size overall ...	12″	12½″	12¾″	13″
Price, per pair ...	**25**/–	**28**/**6**	**36**/–	**42**/–

No. C. with steel screw and nut, **25**/**6** pair.

Fig. 5402. Nickel Plated Sheffield Made Nail Scissors.

Size	3¼	3½	3¾
Price per doz.	**36**/–	**36**/–	**30**/–

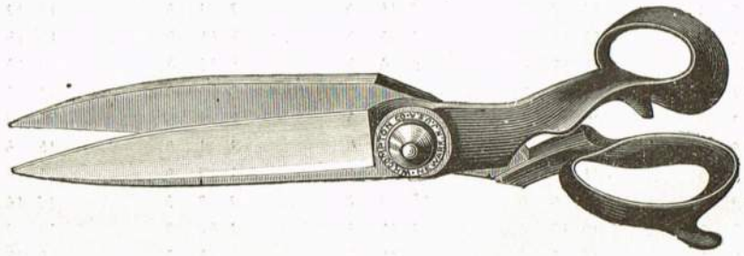

Fig. 5404. Heavy Pattern Tailors' Shears with brass screws.

No.	A.	B.	C.	D.	E.	F.
Size overall ...	13″	13¾″	14″	14½″	14¾″	15¼″
Price, per pair ..	**57**/–	**66**/–	**70**/**6**	**78**/–	**85**/**6**	**93**/–

g. 5401. Sheffield made ickel Plated Cutting-out Scissors.

, inches—

5	6½	7	7½	8
e per doz.—				
/–	**56**/–	**64**/–	**74**/–	**82**/–

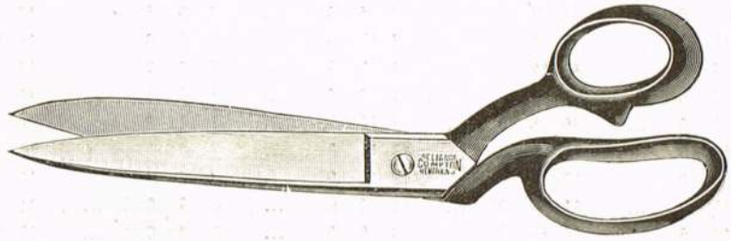

Fig. 5405. Compton Japanned Bent Trimmers.

Size overall ...	6″	6½″	7″	7½″	8″	8½″
Price, per doz. ...	**57**/–	**60**/–	**63**/–	**66**/–	**69**/–	**79**/**6**

Size overall ...	9″	10″	11″	12″	13″
Price, per doz. ...	**93**/–	**112**/**6**	**123**/**6**	**133**/**6**	**147**/–

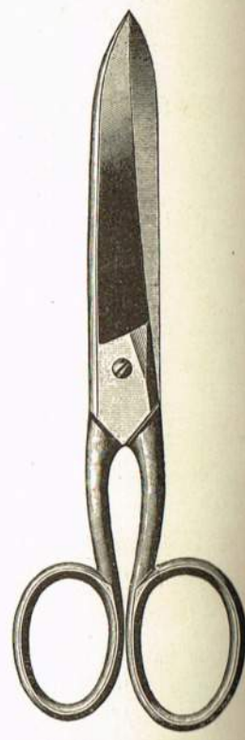

Fig. 5407. Sheffield made Nickel Plated Work-room Scissors.

Size, inches—

5	5½	6	6½	7
Price per doz.—				
37/–	**40**/–	**48**/–	**52**/–	**60**/–

Fig. 5406. Compton Japanned Straight Trimmers.

Size overall ...	6″	7″	8″	9″	10″
Price, per doz. ...	**54**/–	**60**/–	**66**/–	**84**/–	**103**/**6**

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SCISSORS, Etc.

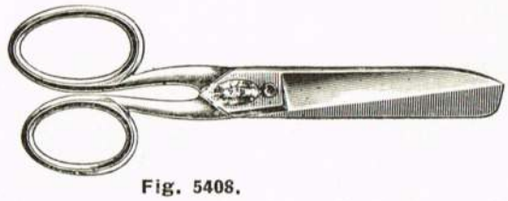

Fig. 5408.

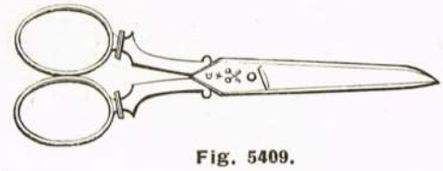

Fig. 5409.

Sheffield made Cutting-out Scissors.

Size	6	6½	7	7½	8	8½	9	9½	10	11	12
Fig. 5408. Price, per dozen...	**46/-**	**51/-**	**56/-**	**62/-**	**69/-**	**75/-**	**87/-**	**96/-**	**109/-**	**133/-**	**171/-**
Fig. 5409. Price, per dozen...	**47/-**	**52/-**	**57/-**	**62/-**	**70/-**	**76/-**	**88/-**	**97/-**	**110/-**	**134/-**	**172/-**

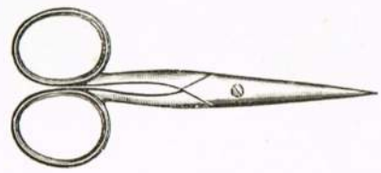

Fig. 5410. Embroidery Scissors.
Best Sheffield made. 3½″ long.
Price **32**/– dozen.

Fig. 5412. Secatures.
Nickel plated all over. Price **14**/– pair.

Fig. 5411. Secatures. Black and Bright.

Size	7	8 inches.
Price	**67**/–	**75**/– dozen.

SETS OF CARVERS IN CASES.

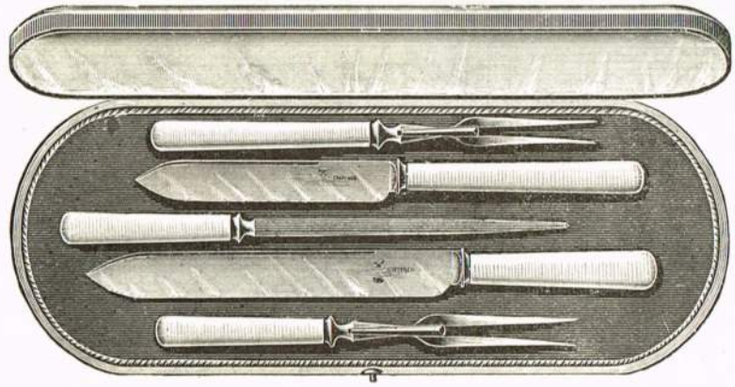

Fig. 5420. Set of Carvers in Cases, Lined Velvet, Covered Morocco Grained Leather.
Carvers in Case, 3 pieces Best Sheffield. Price **30**/– set.
5 Pieces, as shewn. Price **48**/– set.
Carvers in Case, 3 pieces Best Sheffield. Price **44/6** set.
5 Pieces, as shewn. Price **79**/– set.

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KNIVES.

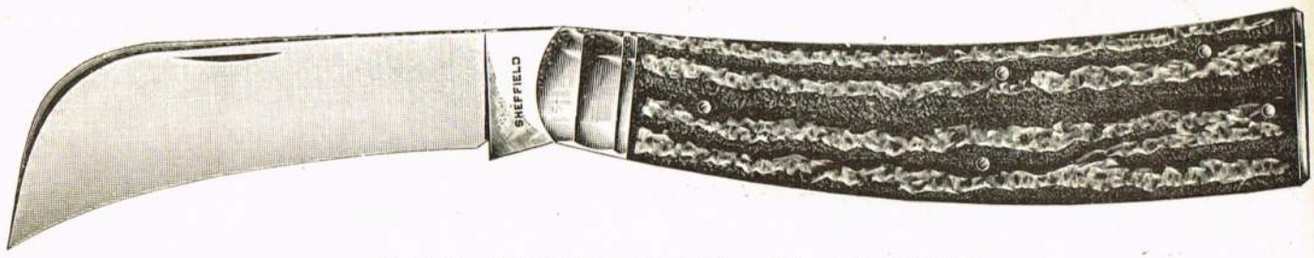

Fig. 5430. Stag Handle Pruning Knife. Price **60**/– per dozen.

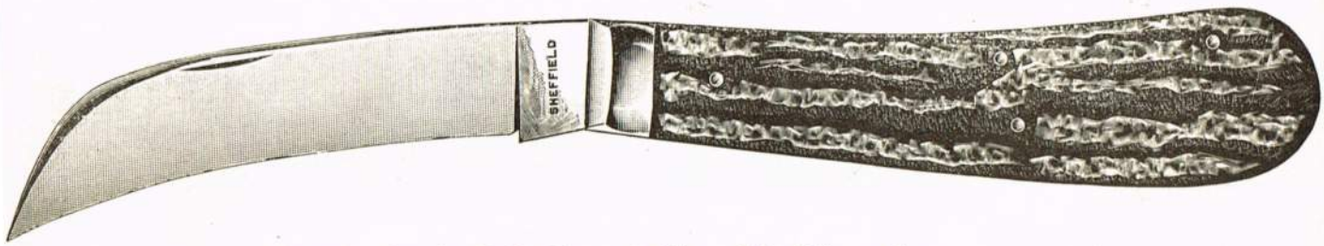

Fig. 5431. Pruning Knife, Stag or Buffalo. Price **44**/– per dozen.

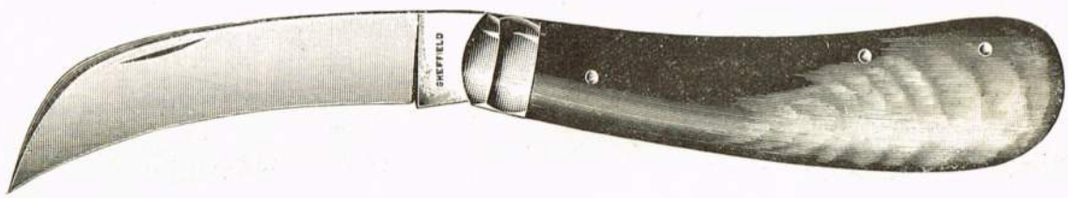

Fig. 5432. Pruning Knife, Buffalo Handle. Price **28**/– per dozen.

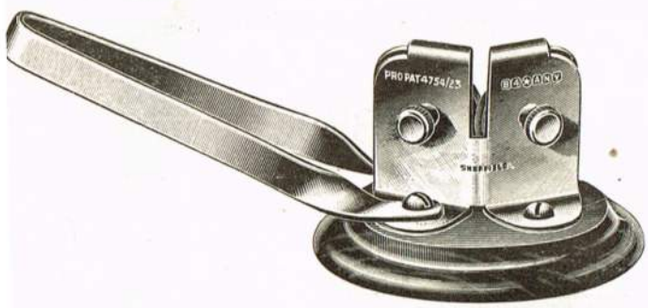

Fig. 5433. Knife Sharpener, fitted with Xylonite handle (not twisted as shown) and base. All parts heavily nickel plated. Roller cutters of special hardened steel. Will last for years. Price **4/6** each.

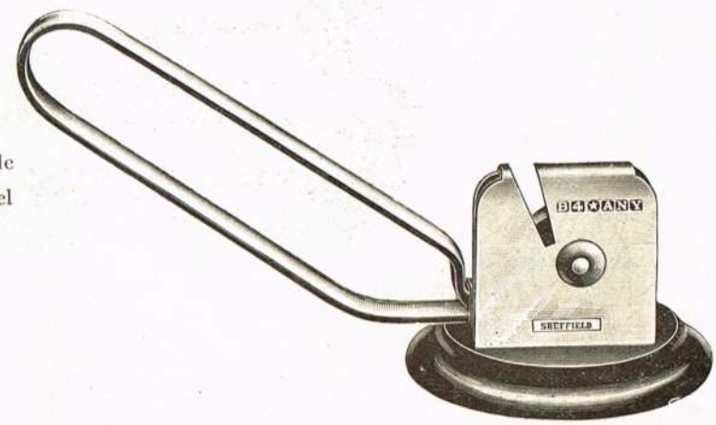

Fig. 5434. Knife Sharpener, nickel plated steel handle ıd body. Highly polished wood base, high grade steel ıtters, all nicely finished. Price **3/9** each.

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KNIFE SHARPENERS, Etc.

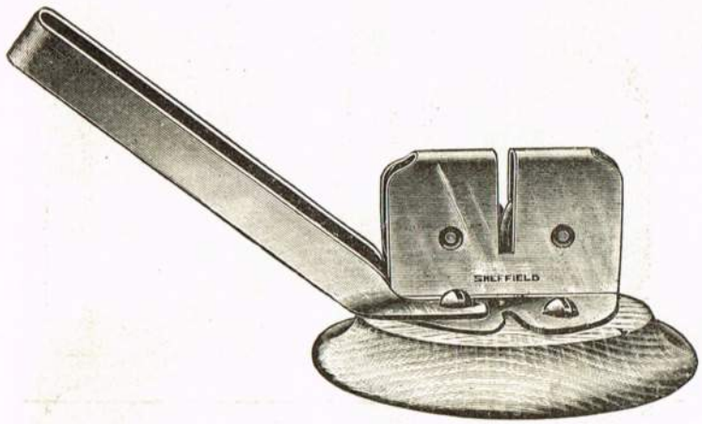

Fig. 5435. Knife Sharpener, nickel plated parts, polished wood base, hardened steel cutters. Simple and effective by merely drawing the knife across the cutter wheels. This takes off a fine shaving each side of the blade. Price **3/9** each.

Fig. 5436. Pocket Nickel Plated Knife Sharpener.

The cutter rollers are made of special hardened steel, and are effective and simple in use. Price **12**/- per dozen.

Fig. 5440. The Celebrated "Kross Keys" Razor.

Superior quality Sheffield made.
Price: Black, **100**/- dozen; Ivory, **192**/- dozen.

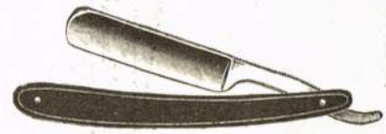

Fig. 5441. Best Sheffield Razors.

Price: Black, **74**/- dozen; Ivory, **136**/- dozen.

Fig. 5442.

Fig. 5443.

ORDINARY AND STAINLESS STEEL TABLE CUTLERY. Xylonite Handles.

Prices: Table, either pattern, **47**/- dozen; **Dessert, 41**/- dozen; **Set Carvers, 25**/**6** per pair.

Other styles of Cutlery quoted for on application. Large stocks of patterns with Ivory handles, etc., as well as complete cabinets.

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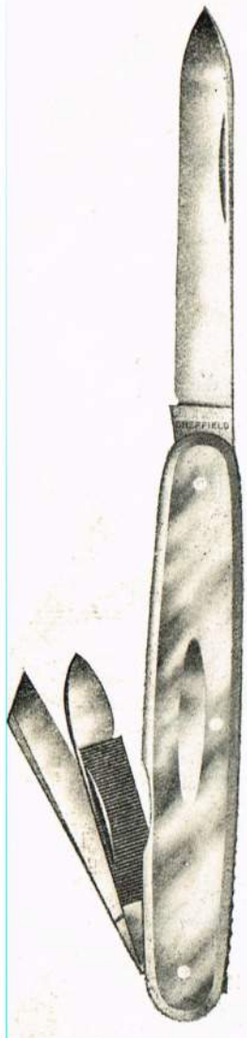
POCKET KNIVES.



g. 5450. Gent.'s Ivory 3–Blade Knife.
ice **100**/– per dozen.

Fig. 5451. 2-Blade
Stainless throughout.
Price **48**/– per dozen.

Fig. 5452. 2-Blade
Xylonite in various colours.
Price **45**/– per dozen.

Fig. 5453. 2-Blade
Stag Handle.
Price **48**/– per dozen.

Fig. 5454. 4-Blade Gent.'s Knife.
Ivory Handle.
Price **96**/– per dozen.

Fig. 5455. 2-Blade Stainless Steel Handle. Price **80**/– per dozen.

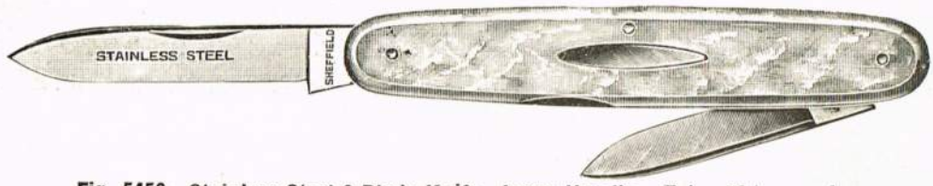


Fig. 5456. Stainless Steel 2-Blade Knife. Ivory Handle. Price **76**/– per dozen.
Pearl Handle. Price **132**/– per dozen. Bevelled Edges.

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POCKET KNIVES.

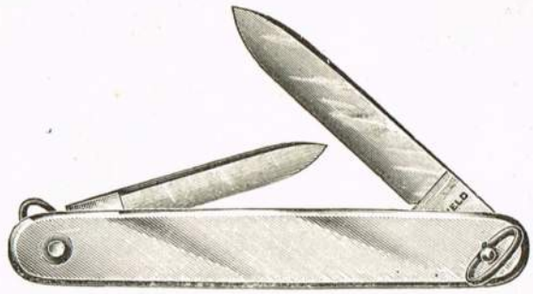

Fig. 5457. Easy to Open Penknife, Nickel Plated. 2 Blades.
Price **36**/– per dozen.

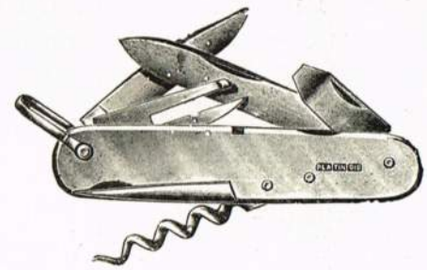

Fig. 5458. Nickel Plaed Sports Knife.
Price **168**/- per dozen.

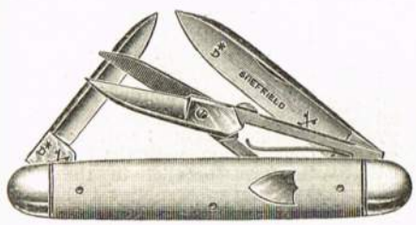

Fig. 5459. 2-Blade Knife and Scissors.
Ivory, Price **110**/- per dozen.
Stag, Price **108**/- per dozen.

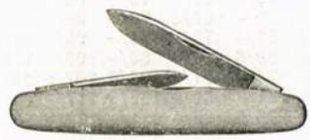

Fig. 5460. Nickel Plated Thin Knife.
Price **50**/– per dozen.

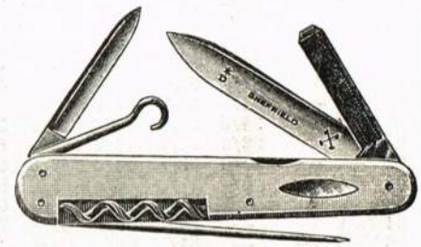

Fig. 5461. 2-Blade Combination Knife.

	Ivory.	Pearl.	Tortoise Shell.
Price	**264**/–	**328**/–	**312**/– doz.

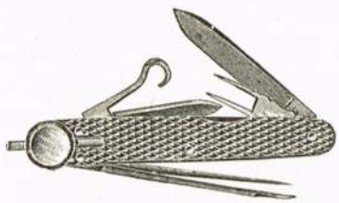

Fig. 5462. Smokers' Knife.

	Chequed.	Ivory.	Pearl.
Price	**18**/6	**20**/6	**28**/– each.

Fig. 5463. Pruning Knife.
Ivory Handle. Price **58**/– per doz.

Fig. 5464. Knife with Tin Opener.
Price **94**/– per dozen.

Fig. 5465. Knife with Champagne Hook.
Price **88**/– per dozen.

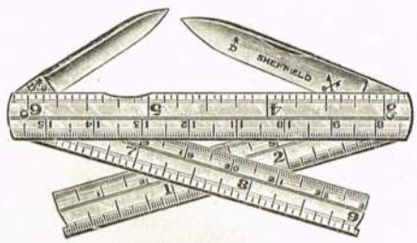

Fig. 5466. Engineers' Knife.
2 Blades, with extended Rule.
Price **114**/– per dozen.

Fig. 5467. Engineers' Knife.
2 Blades.
Price **58**/– per dozen.

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PULLEYS, WOOD.

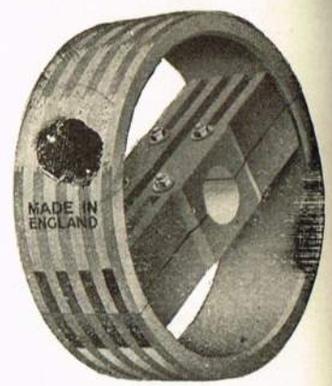

Fig. 5500. WOOD SPLIT PULLEY.

SCIENTIFIC DESIGN. NO OTHER PULLEY IS AS CAREFULLY MADE.

PRICES AND DIMENSIONS. CROWN OR FLAT FACE.

Diam. ins.	Face width in inches. 2	3	4	5	6	7	8	9	10	12	14	16	18	Diam. ins.
3	8/-	8/4	9/-	9/6	10/-	—	—	—	—	—	—	—	—	3
4	8/-	8/4	9/-	9/6	10/-	11/-	12/-	13/-	14/-	16/-	—	—	—	4
5	8/9	9/-	9/6	10/-	11/-	12/-	13/-	14/-	15/-	17/6	—	—	—	5
6	11/9	12/6	13/-	14/-	15/-	16/-	17/-	18/-	19/-	21/-	—	—	—	6
7	12/-	12/6	13/-	14/-	15/-	16/6	17/6	19/-	20/-	22/6	24/6	—	—	7
8	12/6	13/-	13/-	14/6	16/-	17/-	18/-	19/6	21/-	23/6	26/-	—	—	8
9	13/-	13/-	14/-	15/-	16/6	18/-	19/6	21/-	22/-	25/-	27/6	—	—	9
10	—	14/-	14/6	16/-	17/6	19/-	20/6	22/-	24/-	26/6	29/6	32/-	—	10
11	—	15/-	16/-	17/6	19/-	21/-	22/6	24/-	26/-	29/6	33/-	36/-	—	11
12	—	16/-	17/-	19/-	21/-	23/-	24/6	26/6	28/6	32/-	36/-	40/-	44/-	12
13	—	17/-	18/-	20/6	22/6	24/6	27/-	29/-	31/-	35/-	39/6	44/-	48/-	13
14	—	18/6	19/6	22/-	24/-	26/6	29/-	31/-	33/6	38/-	43/-	47/6	52/-	14
15	—	20/-	21/-	24/-	26/-	28/6	31/-	33/6	36/-	41/-	46/6	51/6	56/6	15
16	—	21/-	22/-	25/-	27/6	30/6	33/-	36/-	38/6	44/-	50/-	55/-	61/-	16
17	—	23/-	24/-	26/6	29/6	32/-	35/-	38/-	41/-	47/-	53/-	59/-	65/-	17
18	—	23/6	24/6	28/-	31/-	34/-	37/6	40/6	44/-	50/-	56/6	63/-	69/-	18
19	—	25/-	26/-	29/-	33/-	36/6	40/6	44/-	48/6	54/-	59/6	66/-	73/-	19
20	—	26/-	27/-	31/-	34/6	38/-	41/6	45/-	49/-	56/-	63/6	70/6	78/-	20
21	—	28/-	29/-	33/-	37/-	40/6	44/6	48/-	52/-	60/-	67/-	74/6	82/-	21
22	—	29/-	30/-	34/-	38/-	42/-	46/-	50/-	54/-	62/-	70/-	78/-	86/-	22
23	—	31/-	32/-	36/6	41/-	45/-	50/-	54/-	58/6	67/-	74/6	83/6	92/-	23
24	—	32/-	33/-	37/6	42/-	47/-	51/6	56/-	61/-	70/-	79/6	89/-	98/-	24
25	—	33/-	34/-	39/6	44/6	49/6	55/-	59/6	65/-	75/-	84/6	94/-	104/-	25
26	—	34/6	35/6	41/-	46/6	51/6	57/-	62/-	67/6	78/-	89/-	99/6	110/-	26
27	—	36/6	37/6	43/6	49/-	54/6	60/6	66/-	72/-	83/-	94/-	105/-	116/-	27
28	—	37/6	38/6	44/6	50/6	56/6	62/6	68/6	74/6	86/-	98/-	110/-	122/-	28
30	—	40/-	41/6	48/-	55/-	61/6	68/-	74/6	81/-	94/6	107/6	121/-	134/-	30
32	—	—	44/6	52/-	59/-	66/-	73/6	81/-	88/-	102/6	117/-	131/6	146/-	32
34	—	—	48/-	56/-	64/-	71/6	79/6	87/6	95/-	111/-	126/6	142/6	158/-	34
36	—	—	51/6	60/-	68/6	77/-	85/6	94/-	102/6	119/6	136/6	153/6	170/6	36
38	—	—	57/-	—	73/-	—	91/6	—	109/6	128/-	146/-	164/6	183/-	38
40	—	—	62/-	—	77/6	—	97/6	—	116/6	136/6	158/-	175/6	195/-	40
42	—	—	69/-	—	83/-	—	104/6	—	126/-	147/-	168/-	189/6	211/-	42
44	—	—	76/-	—	89/-	—	111/6	—	134/6	160/-	180/6	203/6	226/6	44
46	—	—	—	—	94/6	—	119/6	—	144/-	168/6	193/6	218/-	243/-	46
48	—	—	—	—	101/6	—	127/6	—	153/6	180/-	206/6	233/-	259/-	48
50	—	—	—	—	108/-	—	136/-	—	164/-	192/-	220/-	248/-	276/-	50
52	—	—	—	—	115/-	—	145/-	—	174/6	204/6	234/6	264/-	294/-	52
54	—	—	—	—	123/-	—	154/-	—	185/6	217/-	248/6	280/-	311/6	54
56	—	—	—	—	131/-	—	164/-	—	197/-	230/6	263/6	296/6	329/6	56
58	—	—	—	—	139/6	—	174/6	—	209/-	244/-	279/-	313/6	348/6	58
60	—	—	—	—	148/-	—	184/6	—	221/6	258/6	294/6	331/-	367/6	60
66	—	—	—	—	178/-	—	220/-	—	262/-	304/6	346/6	388/6	430/6	66
72	—	—	—	—	212/6	—	261/-	—	309/6	358/-	406/-	455/-	503/-	72

When ordering, please give diameter and width of face of pulleys required, also diameter of shaft. State whether flat or crown face pulley is required.

Bushing.—Wood bushing is supplied free with every pulley. Extra bushings in all sizes supplied. Prices on application.

The rim of this pulley is built up from sectors cut to shape. All the sectors in the rim are tongued and glued together.

All joints are thoroughly glued. Wooden dowels, each a driving fit, are inserted through the rim at regular spaces. The result of these careful processes is a homogeneous rim that contains no nails (ordinary pulleys are merely nailed together and not jointed or dowelled).

The arms of the pulley are disposed so as to use the full strength of the hardwood of which they are composed. They are arranged on edge ; not, as in cheap construction, with the breadth of the arm parallel to the shaft. The narrowest pulley is built on two such arms ; in wider pulleys the arms are duplicated and re-duplicated.

Note that the arms are the only part of a pulley to encounter air resistance, and that the arms present their narrow edge to the air, reducing resistance to a minimum.

The ends of the arms of the pulley are carried through to the face of the pulley and become an integral part of the rim. These arms are dowelled into the rim. Every joint throughout is carefully glued and properly set.

Care has been taken to provide an absolutely rigid joint at the points of contact of the rim : *i.e.*, where the halves of the pulley meet. The ends are not merely left flat : they are arranged to interlock, so that no shake can possibly occur.

INFORMATION REGARDING DETAILS.

SPECIAL SIZES, Etc.—Where pulleys of extreme face-width are required, we supply two or more pulleys on a common bush, to make up the required measurement. These are charged at their usual prices. Where desired these pulleys can be dowelled together at slight extra charge (making one pulley), and if necessary the face of the whole can be crowned.

For intermediate diameters (between the standard inch sizes) pulleys are turned down from next larger standard size, and charged at usual price for the larger size plus small charge for turning down.

BORES AND BUSHING.—These pulleys are "split," *i.e.*, constructed in separable halves so that the pulley may be mounted upon existing shafting without disturbing the shafting. They are bored out to standard measurements larger than the average shaft : by means of standardized bushing (supplied free) they can be fitted to any shaft.

THE STANDARD BORES are :

Small pulleys, 3″ and 4″ diameter	$1\frac{1}{2}$″ bore.
Pulleys 5″ to 11″ diameter	$2\frac{1}{2}$″ ,,
All pulleys 12″ diameter and upwards	$3\frac{1}{2}$″ ,,

Larger bores to order.

BUSHING.—Standardized hardwood bushing is supplied free with every pulley to reduce the bore to required size. For re-mounting and other purposes, **extra bushing** can be supplied in any size and quantity. Bushing is made in the following sizes :

$1\frac{1}{2}$″	outer	diameter	....	for shafts	1 and $1\frac{1}{4}$″.
2″	,,	,,	....	,,	$1\frac{1}{4}$, $1\frac{1}{2}$ and $1\frac{3}{4}$″.
$2\frac{1}{2}$″	,,	,,	....	,,	1, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{5}{8}$, $1\frac{3}{4}$, $1\frac{7}{8}$, 2 and $2\frac{1}{4}$″.
3″	,,	,,	....	,,	1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, and $2\frac{3}{4}$″.
$3\frac{1}{2}$″	,,	,,	....	,,	1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$, $1\frac{5}{8}$, $1\frac{3}{4}$, $1\frac{7}{8}$, 2, $2\frac{1}{8}$, $2\frac{1}{4}$, $2\frac{3}{8}$, $2\frac{1}{2}$, $2\frac{5}{8}$, $2\frac{3}{4}$, $2\frac{7}{8}$, 3 and $3\frac{1}{4}$″.
4″	,,	,,	....	,,	$3\frac{1}{2}$″.

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PULLEYS (WROUGHT STEEL).

This Steel Split Pulley is as light as is consistent with strength and safety.

It consists of a rim of one-ply steel, made exceedingly stiff by an interior flange to which the arms are attached. The heavy rolled beads at the edges of the face likewise add materially to the strength of the rim. The arms of patent construction are flat, with their narrow edges cutting the atmosphere. They converge from near the extremities of the hub to the central flange of the rim, thus making an " A " frame of great strength.

A tight-clamping all-steel hub, slightly compressible, grips the shaft with such force that in most cases key-way and set screw are rendered unnecessary.

Steel Pulleys are quickly and easily installed without shaft stripping, and may be bushed down to fit varying sizes of shaft.

Because of their lightness, trueness, balance and belt-gripping qualities, steel pulleys diminish loss of power. Special bushing for loose pulleys.

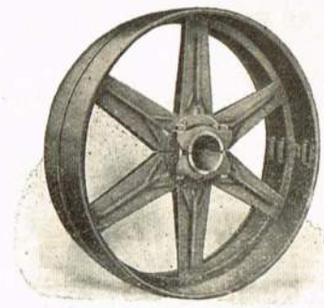

Fig. 5501.

Crown or Flat Face.

PRICES AND DIMENSIONS.

Diameter in ins.		2	3	4	5	6	8	10	12
3	....	11/6	12/–	12/9	—	—	—	—	—
4	....	12/–	12/9	13/3	13/9	—	—	—	—
5	....	12/9	13/3	13/9	14/6	—	—	—	—
6	....	15/9	16/6	17/3	18/9	20/3	23/–	—	—
7	....	16/3	17/–	18/–	19/6	21/–	23/6	—	—
8	....	16/6	17/3	18/9	20/3	21/9	24/9	28/–	—
9	....	17/–	18/–	19/6	21/–	22/6	25/6	28/9	—
10	....	17/3	18/9	20/3	21/9	23/3	26/3	29/6	32/3
11	....	18/3	19/6	21/–	22/6	24/–	27/–	30/–	34/6
12	....	19/6	21/–	23/3	24/–	26/9	29/–	32/3	38/3
13	....	20/3	21/9	24/–	26/–	28/3	32/3	36/–	42/–
14	....	21/–	22/6	26/–	28/3	30/9	35/3	40/3	45/–
15	....	21/9	23/3	27/3	29/–	32/6	38/3	44/–	48/9
16	....	22/6	24/9	28/9	30/6	34/6	41/3	47/3	52/6
17	....	—	26/3	30/–	32/6	36/6	44/–	50/3	56/3
18	....	—	27/9	32/–	35/–	38/3	46/6	53/3	60/–
19	....	—	29/–	33/9	37/6	41/3	50/9	56/3	64/6
20	....	—	30/–	37/6	40/6	45/–	53/9	60/–	71/3
22	....	—	32/6	42/9	47/6	51/6	60/–	70/6	84/–
24	....	—	37/6	44/6	50/–	54/9	66/–	78/6	95/3
26	....	—	—	47/9	—	59/9	72/–	85/6	106/6
28	....	—	—	54/–	—	64/6	77/3	90/9	114/6
30	....	—	—	60/–	—	70/6	86/3	99/6	123/9
32	....	—	—	66/–	—	77/3	96/9	112/6	134/6
34	....	—	—	72/–	—	86/3	108/9	127/6	150/–
36	....	—	—	79/6	—	97/6	120/–	143/3	168/9
38	....	—	—	97/6	—	108/9	132/–	155/3	185/9
40	....	—	—	105/–	—	120/–	142/6	168/9	200/9
42	....	—	—	116/3	—	131/3	161/3	187/6	217/6
44	...	—	—	—	—	146/3	178/3	206/3	236/3
46	....	—	—	—	—	165/–	195/–	225/–	251/–
48	....	—	—	—	—	184/–	210/–	244/–	270/–

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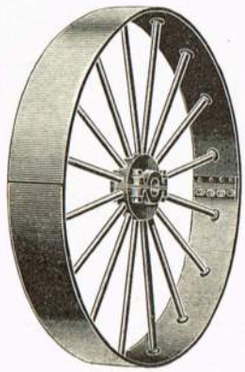
PULLEYS (WROUGHT IRON).

All Pulleys constructed of finest material under the most efficient workshop equipment. They are perfectly balanced and can be driven at high speeds without danger.

Fig. 5502. **CROWN OR FLAT FACE, SPLIT OR SOLID.**



Double-Arm Pulleys recommended where the breadth of rim is more than **12 ins.,** and the price is double the cost of Single Arm Pulley of half the width, *i.e.*, a 12″ Double Arm Pulley would be charged the same price as two Single-Armed Pulleys 6″ wide.

Bores.

Pulleys up to 48″	....	3″ bore.
Pulleys from 48″ to 60″	....	4″ ,,
,, ,, 60″ to 72″	....	5″
,, ,, 72″ to 84″	....	6″
,, ,, 84″ to 96″	....	7″ ,,
,, ,, 96″ to 120″	....	8″ ,,

For Bores above these sizes a charge of **2/6** per inch for Single-Armed Pulleys and **4**/– per inch for Double-Armed Pulleys is made.

No charge is made for keyways which are cut proportionate to the bore. Set screw can, however, be fitted at a small cost.

Fast and Loose Whole Pulleys supplied without extra charge. Split Fast and Loose Pulleys are, however, subject to a small extra charge, as follows :

Up to 30″ diam. × 8″ broad, **3**/– per pair.
From 30″ to 40 diam. × 9″ broad, **5**/– per pair.
Up to 30″ diam. × 9″ to 12″ broad, **5**/– per pair.
From 30″ to 48″ diam. × 9″ × 12″ broad, **8**/– per pair.

Diam. in inches.	Breadth of Face in Inches. 3	4	5	6	7	8	9	10	11	12
10	**10/6**	**11/6**	**12/6**	**14/–**	**15/6**	**16/6**	**18/6**	**20/6**	**23/6**	**25/6**
12	**11/6**	**12/6**	**13/6**	**14/6**	**16/–**	**17/6**	**19/6**	**21/6**	**24/–**	**26/6**
14	**12/–**	**13/6**	**14/6**	**15/6**	**16/6**	**18/–**	**20/–**	**22/–**	**24/6**	**27/6**
16	**13/6**	**14/6**	**15/6**	**16/6**	**18/–**	**19/6**	**21/6**	**23/6**	**26/–**	**28/6**
18	**14/6**	**16/–**	**17/6**	**19/6**	**20/6**	**22/–**	**23/6**	**24/6**	**27/6**	**29/6**
20	**16/–**	**18/–**	**20/–**	**21/–**	**23/–**	**24/–**	**25/6**	**26/6**	**28/–**	**30/6**
22	**18/–**	**19/6**	**21/6**	**24/–**	**25/6**	**26/6**	**28/–**	**29/6**	**31/6**	**33/–**
24	**20/–**	**22/–**	**23/6**	**26/–**	**27/6**	**28/6**	**30/6**	**32/–**	**34/–**	**36/–**
26	**22/6**	**24/–**	**26/–**	**28/–**	**30/–**	**31/6**	**33/6**	**34/6**	**36/6**	**38/6**
28	**25/6**	**27/6**	**28/6**	**30/–**	**32/–**	**34/–**	**36/–**	**38/–**	**40/–**	**41/6**
30	**26/6**	**28/6**	**30/6**	**32/–**	**34/–**	**36/–**	**38/–**	**39/6**	**41/6**	**44/–**
32	**28/6**	**30/–**	**32/–**	**34/–**	**36/–**	**38/–**	**40/–**	**42/–**	**44/–**	**46/–**
34	**30/–**	**32/–**	**34/–**	**36/–**	**38/–**	**40/–**	**42/–**	**44/–**	**46/–**	**48/–**
36	**32/–**	**34/–**	**36/–**	**38/–**	**40/–**	**42/–**	**44/–**	**46/–**	**48/–**	**50/6**
38	**36/–**	**38/6**	**41/–**	**42/–**	**44/–**	**46/–**	**48/–**	**50/6**	**54/–**	**56/–**
40	**38/–**	**40/–**	**42/6**	**45/–**	**47/6**	**49/6**	**52/–**	**55/6**	**57/6**	**60/–**
42	**39/6**	**42/–**	**45/–**	**48/–**	**50/–**	**52/6**	**55/–**	**58/–**	**60/6**	**64/–**
44	**44/6**	**47/6**	**50/6**	**53/–**	**55/6**	**57/6**	**60/–**	**63/6**	**67/–**	**69/–**
46	**48/–**	**50/6**	**53/–**	**56/–**	**57/6**	**60/–**	**62/6**	**65/6**	**69/–**	**72/–**
48	**50/–**	**52/6**	**55/–**	**57/–**	**59/–**	**61/6**	**64/–**	**67/–**	**70/6**	**73/6**
50	**54/–**	**56/6**	**59/–**	**60/6**	**63/6**	**66/–**	**68/–**	**71/6**	**74/6**	**78/–**
52	**58/–**	**60/6**	**63/6**	**65/–**	**67/6**	**70/–**	**72/–**	**75/6**	**78/6**	**82/–**
54	**62/–**	**64/6**	**67/–**	**69/–**	**71/6**	**74/–**	**76/–**	**79/6**	**82/6**	**86/–**
56	**66/–**	**68/6**	**69/6**	**73/–**	**75/6**	**78/–**	**80/–**	**83/6**	**86/6**	**89/–**
58	**70/–**	**73/–**	**76/–**	**77/6**	**79/6**	**82/–**	**84/–**	**87/6**	**90/6**	**93/6**
60	**74/–**	**76/6**	**79/–**	**80/6**	**83/6**	**87/–**	**88/–**	**91/6**	**94/6**	**98/–**
62	**79/–**	**81/6**	**84/–**	**85/6**	**88/–**	**91/–**	**93/–**	**96/–**	**100/–**	**103/–**
64	**84/–**	**86/–**	**88/6**	**91/–**	**93/–**	**95/–**	**98/–**	**101/–**	**104/–**	**108/–**
66	**89/–**	**91/–**	**93/6**	**95/6**	**98/–**	**100/–**	**103/–**	**107/6**	**109/6**	**112/–**
68	**93/6**	**95/6**	**98/–**	**100/–**	**102/6**	**105/–**	**107/6**	**110/6**	**113/6**	**117/6**
70	**98/–**	**100/6**	**103/–**	**105/–**	**107/6**	**110/–**	**112/–**	**115/6**	**118/6**	**122/–**
72	**103/–**	**105/6**	**108/–**	**110/–**	**112/–**	**115/–**	**117/–**	**120/–**	**124/–**	**127/–**

Larger sizes quoted for upon application.

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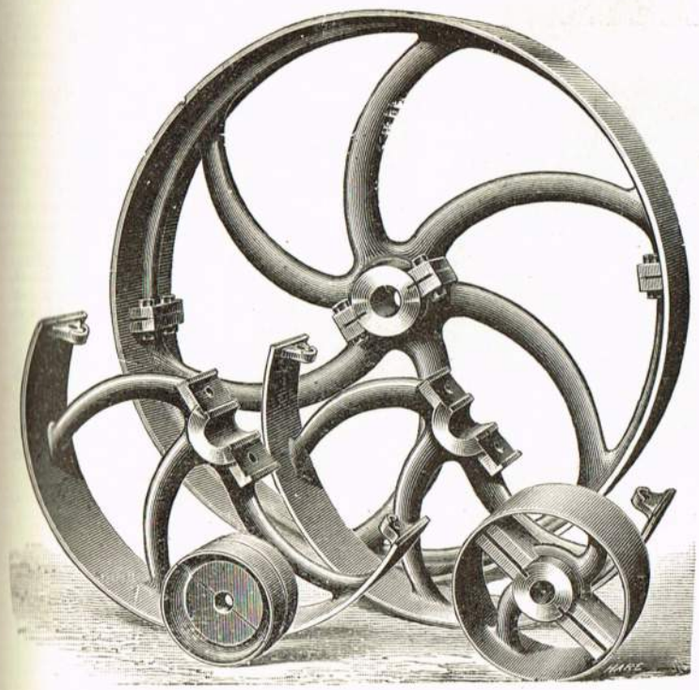

PULLEYS.

Fig. 5503. Cast Iron Split Pulleys.

These pulleys are split and bolted up, turned on face flat or round, with key-ways or set-screws. For main lines of shafting split pulleys, bored slightly scant, ensuring a tight grip on the shaft. There is no fear of slippng, and pulley can be moved to any desired position. Flat face sent unless otherwise specified.

Round or Flat face.

Fig. 5504. Large Cast Iron Split Pulleys.
Split and Bolted up, Turned Flat or Rounding on Face.

Diam ins.	Max. bore ins.	Width. 8″ £ s. d.	10″ £ s. d.	12″ £ s. d.	14″ £ s. d.
62	6	5 12 6	6 5 0	6 19 6	8 2 0
64	6	5 17 6	6 10 0	7 5 6	8 9 0
66	6	6 2 6	6 15 0	7 12 6	8 15 0
68	6	6 7 6	7 0 0	7 19 6	9 2 0
70	6	6 12 6	7 5 0	8 5 6	9 9 0
72	6	6 17 6	7 10 0	8 12 6	9 15 0
78	6	8 0 0	8 12 6	9 15 0	11 2 5
84	6	9 2 6	9 15 0	10 12 6	12 5 0
90	6	11 5 0	11 17 6	13 0 0	14 10 0
96	6	12 10 0	14 0 0	15 0 0	17 5 0

2½″ max. bore up to and including 8″ diam ; 3″ max. bore from 9″ to 16″ diam. inclusive.

Diam. ins.	Max. bore ins.	2½″ Max. bore. 3″ face.	Width on Face. 4″	5″	6″	7″	8″	9″	10″	11″	12″
5	—	5/9	6/6	7/–	—	—	—	—	—	—	—
6	—	6/–	7/–	7/6	8/–	—	—	—	—	—	—
7	—	6/6	7/6	8/–	8/6	10/–	—	—	—	—	—
8	—	7/–	8/–	8/6	9/6	11/–	12/6	—	—	—	—
9	—	7/6	8/6	9/–	10/–	11/6	13/–	15/–	—	—	—
10	—	8/–	9/–	10/6	11/6	13/–	14/6	16/–	17/6	—	—
11	—	8/6	9/6	11/–	12/–	13/6	15/–	16/6	18/–	20/6	—
12	—	9/–	10/6	11/6	12/6	14/–	16/–	17/6	19/–	21/6	23/6
13	—	9/6	11/–	12/–	13/–	14/6	16/6	18/–	20/–	22/6	24/6
14	—	10/–	11/6	12/6	13/6	15/–	17/–	19/–	21/–	24/–	25/6
15	—	10/6	12/–	13/–	14/–	15/6	17/6	19/6	21/6	24/6	27/–
16	—	11/–	12/6	13/6	14/6	16/–	18/–	20/–	22/–	25/–	27/6
17	3	—	14/6	16/–	17/–	19/–	20/–	23/–	25/–	28/–	30/6
18	3	—	15/6	17/–	18/–	20/–	21/6	24/–	26/6	29/6	32/–
19	3	—	16/6	18/–	19/–	21/–	23/–	25/6	28/–	31/–	33/6
20	3	—	17/6	19/–	20/–	22/–	24/–	26/6	29/–	32/–	34/6
21	3	—	18/6	20/–	21/–	23/–	25/–	27/6	30/–	33/–	35/6
22	3	—	19/6	21/–	22/6	25/–	27/–	29/6	32/–	35/–	37/6
23	3	—	20/6	22/–	23/6	26/–	28/–	31/6	33/6	36/6	39/–
24	3	—	21/–	23/–	24/6	27/–	29/6	32/6	35/–	38/–	40/6
25	3	—	23/–	25/–	27/–	29/6	32/–	35/–	37/6	41/–	44/–
26	3	—	24/–	26/–	28/–	30/6	33/–	36/6	39/–	42/6	46/–
27	3	—	25/–	27/–	29/–	31/6	34/–	37/6	40/6	44/–	47/6
28	3	—	26/–	28/–	30/–	32/6	35/–	38/6	41/6	45/–	49/–
29	3	—	27/–	29/–	31/–	33/6	36/–	39/6	42/6	47/6	51/–
30	3	—	28/–	30/–	32/–	34/6	37/–	40/6	44/6	49/–	53/–
31	3	—	29/–	31/6	32/6	36/–	38/–	42/–	45/–	51/6	54/6
32	3	—	30/6	33/–	35/–	37/6	39/6	43/–	47/–	52/–	56/–
33	3	—	31/6	34/–	36/–	39/–	41/6	45/–	49/–	54/–	58/6
34	3	—	32/6	35/–	37/–	40/–	42/6	46/–	50/6	56/–	61/–
35	3	—	33/6	36/–	38/–	41/–	43/6	47/–	51/6	57/–	62/6
36	3	—	34/6	37/–	39/–	42/–	44/6	48/–	52/6	58/–	63/6
37	3	—	—	38/3	40/6	43/6	46/3	50/–	54/3	60/3	65/6
38	3	—	—	39/6	42/–	45/–	48/–	52/–	56/–	62/6	67/6
39	4	—	—	40/6	43/–	46/–	49/–	54/–	58/6	65/–	70/–
40	4	—	—	42/–	44/6	48/–	51/–	56/–	61/–	67/6	72/6
41	4	—	—	43/9	46/6	50/6	53/6	58/6	63/6	70/–	75/–
42	4	—	—	45/6	48/6	53/–	56/–	61/–	66/–	72/6	77/6
43	4	—	—	47/–	50/3	54/6	58/6	64/3	69/3	76/3	81/3
44	4	—	—	48/6	52/–	56/–	61/–	67/6	72/6	80/–	85/–
45	4	—	—	50/6	52/6	58/–	63/–	70/–	75/–	82/6	87/6
46	4	—	—	51/6	54/6	60/–	65/–	72/6	77/6	85/–	90/–
47	4	—	—	53/–	57/–	62/6	67/6	75/–	80/–	87/6	92/6
48	4	—	—	54/6	59/6	65/–	70/–	77/6	82/6	90/–	95/–
50	4	—	—	—	—	69/–	75/–	85/–	90/–	97/6	102/6
52	4	—	—	—	—	73/–	78/6	87/6	95/–	102/6	107/6
54	4	—	—	—	—	76/–	81/–	90/–	97/6	107/6	112/6
56	4	—	—	—	—	82/6	87/6	95/–	102/6	112/6	117/6
58	4	—	—	—	—	87/6	92/6	100/–	107/6	117/6	122/6
60	4	—	—	—	—	92/6	97/6	107/6	112/6	122/6	130/–

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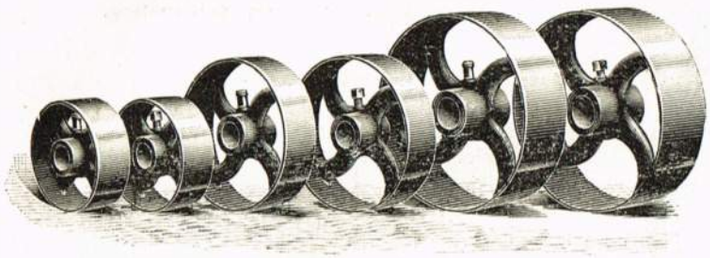
PULLEYS.



Round or Flat Face with Keyways or Set Screws.

Add 10% for polished face. Pulleys can be balanced at the following extra charges :—**3**/– up to 24″, **3**/**9** up to 36″, **4**/**6** up to 48″, **5**/**6** up to 60″.

CAST-IRON WHOLE PULLEYS.

Large Cast-Iron Whole Pulleys. Fig. 5505.

Flat or Round Face.

Dia. Ins.	Max. Bore. Ins.	Width. 8 ins.	10 ins.	12 ins.	14 ins.
62	6	£5 0 0	£5 10 0	£5 2 0	£7 2 0
64	6	5 5 0	5 15 0	6 9 0	7 9 0
66	6	5 10 0	6 0 0	6 15 0	7 15 0
68	6	5 15 0	6 5 0	7 2 0	8 2 0
70	6	6 0 0	6 10 0	7 9 0	8 9 0
72	6	6 5 0	6 15 0	7 15 0	8 15 0
78	6	7 5 0	7 15 0	8 15 0	10 0 0
84	6	8 5 0	8 15 0	9 10 0	11 0 0
90	6	10 5 0	10 15 0	11 10 0	13 0 0
96	6	12 5 0	12 15 0	13 10 0	15 10 0

Fig. 5506.

Diam. Ins.	Width on Face. 2″ Max. Bore 1½″	3″ Max. Bore 2″	4″ Max. Bore 3″	5″ Max. Bore 3″	6″ Max. Bore 3″
3	1/–	1/6	...	—	—
3½	1/3	1/9	—	—	—
4	1/6	2/–	4/–	4/6	5/–
5	1/9	2/3	4/6	5/–	5/6
6	2/–	2/6	4/9	5/3	6/–
7	2/4	3/–	5/3	5/9	6/6
8	2/8	3/6	5/6	6/3	7/–
9	3/–	4/–	6/–	6/9	7/6
10	3/4	4/6	6/6	7/3	8/–
11	3/8	4/9	7/–	7/9	8/6
12	4/–	6/–	7/6	8/3	9/–
13	4/4	5/6	7/9	8/6	9/3
14	4/8	5/9	8/–	8/9	9/6
15	5/–	6/3	8/6	9/3	10/–
16	5/4	6/9	9/–	9/9	10/6
17	5/8	7/–	9/6	10/6	11/6
18	6/–	7/6	10/6	11/3	12/–
19	6/4	8/–	11/6	12/3	13/–
20	6/8	8/6	12/–	12/9	13/6
21	7/–	9/–	13/–	13/6	14/–
22	7/6	9/6	13/6	14/3	15/–
23	8/–	10/–	14/–	15/–	16/–
24	8/6	10/6	15/–	16/–	17/–
25	No	11/6	16/6	18/–	19/–
26	Pattern	12/6	18/–	20/–	21/–
27	above	15/–	20/–	22/–	23/–
28	24	17/6	22/–	24/–	25/–
29	Ins.	18/9	24/–	25/–	27/6
30	—	20/–	25/–	26/–	28/6
31	—	No	26/–	28/–	30/–
32	—	Pattern	27/–	29/–	31/–
33	—	above	28/–	30/–	32/–
34	—	30	29/–	31/–	33/–
35	—	Ins.	30/–	32/–	34/–
36	—	—	31/–	33/–	35/–
37	Note.—Pulleys		33/–	34/–	36/3
38	2 and 3 ins. wide		35/–	35/–	37/6
39	if bored larger		36/–	36/–	38/6
40	than the		37/6	37/6	40/–
41	maximum given		37/9	39/3	42/–
42	will be made		38/–	41/–	44/–
43	from 4ins.		41/–	42/6	45/9
44	patterns and		44/–	44/–	47/6
45	charged		46/–	46/–	48/–
46	accordingly.		47/–	47/–	50/–
47			47/3	48/6	52/6
48			47/6	50/–	55/–

Diam. Ins.	Max. Bore Ins	Width on Face. 7″	8″	9″	10″	11″	12″
7	3	8/6	—	—	—	—	—
8	3	9/6	11/–	—	—	—	—
9	3	10/–	11/6	13/–	—	—	—
10	3	11/–	12/6	14/–	15/6	—	—
11	3	11/6	13/–	14/6	16/–	18/–	—
12	3	12/6	14/–	15/6	17/–	19/–	21/–
13	3	13/–	14/6	16/6	18/–	20/–	22/–
14	3	13/6	15/–	17/–	19/–	21/6	23/–
15	3	14/–	15/6	17/6	19/6	22/–	24/6
16	3	14/6	16/–	18/–	20/–	22/6	25/–
17	3	15/6	17/–	19/–	21/–	23/6	26/–
18	3	16/6	18/–	20/–	22/6	25/–	27/6
19	3	17/6	19/6	21/6	24/–	26/6	29/–
20	3	18/6	20/6	22/6	25/–	27/6	30/–
21	3	19/6	21/6	23/6	26/–	28/6	31/–
22	3	21/6	23/6	25/6	28/–	30/6	33/–
23	3	22/6	24/6	27/–	29/6	32/–	34/6
24	3	23/6	26/–	28/6	31/–	33/6	36/–
25	3	25/6	28/–	30/6	33/–	36/–	39/–
26	3	26/6	29/–	32/–	34/6	37/6	41/–
27	3	27/6	30/–	33/–	36/–	39/–	42/6
28	3	28/6	31/–	34/–	37/–	40/–	44/–
29	3	29/6	32/–	35/–	38/–	42/–	46/–
30	3	30/6	33/–	36/–	40/–	44/–	48/–
31	3	32/–	34/–	37/–	41/–	45/–	49/–
32	3	33/–	35/–	38/–	42/–	46/–	50/–
33	3	34/6	37/–	40/–	44/–	48/–	52/6
34	3	35/6	38/–	41/–	45/6	50/–	55/–
35	3	36/6	39/–	42/–	46/6	51/–	56/–
36	3	37/6	40/–	43/–	47/6	52/6	57/6
37	3	38/9	41/6	44/6	48/9	53/9	58/9
38	3	40/–	43/–	46/–	50/–	55/–	60/–
39	4	41/–	44/–	48/–	52/6	57/6	62/6
40	4	43/–	46/–	50/–	55/–	60/–	65/–
41	4	45/6	48/6	52/6	57/6	62/6	67/6
42	4	48/–	51/–	55/–	60/–	65/–	70/–
43	4	49/6	53/6	57/6	62/6	67/6	72/6
44	4	51/–	56/–	60/–	65/–	70/–	75/–
45	4	53/–	58/–	62/6	67/6	72/6	77/5
46	4	55/–	60/–	65/–	70/–	75/–	80/–
47	4	57/6	62/6	67/6	72/6	77/6	82/6
48	4	60/–	65/–	70/–	75/–	80/–	85/–
50	4	63/–	69/–	75/–	80/–	85/–	90/–
52	4	67/–	72/6	77/6	85/–	90/–	95/–
54	4	70/–	75/–	80/–	87/6	95/–	100/–
56	4	75/–	80/–	85/–	92/6	100/–	105/–
58	4	80/–	85/–	90/–	97/6	105/–	110/–
60	4	85/–	90/–	97/6	102/6	110/–	117/6

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PULLEYS.

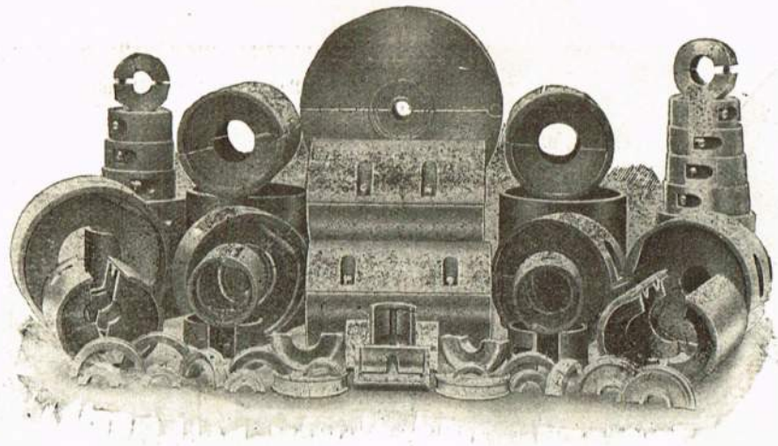

Fig. 5507. "EASEPHIX" CAST IRON SPLIT PULLEYS AND ALUMINIUM SPLIT PULLEYS.

Fixed in any position on the shaft in a few moments. Screw-driver slotted screws, containing 5 tommy holes for final tightening up, secure the pulley to the shaft. No other pulley on the market permits such large bores. Keying is entirely unnecessary, as it is impossible for the pulley to slip on the shaft. "Easephix" pulleys are bored to fit shafts of standard sizes: when shafts are found to be under-sized the bead across the jaws of the pulley should be reduced with the aid of a file.

Dia. ins.	Bores up to ins.	Std. bores ins.	Width of face. 2	3	4	5	6	7	8	9	10	12
3	2	1½	**6/–**	**7/–**	**8/–**	**9/–**	**10/–**	**12/6**	**15/–**	—	—	—
4	3	2½	**7/–**	**8/–**	**9/–**	**10/–**	**11/–**	**13/6**	**16/–**	—	—	—
5	3½	3	**8/–**	**9/–**	**10/–**	**11/–**	**12/–**	**14/6**	**17/–**	**19/6**	**23/–**	**26/–**
6	4½	3	**9/–**	**10/–**	**11/–**	**12/–**	**13/–**	**15/6**	**18/–**	**20/6**	**24/6**	**27/6**
7	5½	3	**10/6**	**11/6**	**12/6**	**13/6**	**14/6**	**17/–**	**19/6**	**22/–**	**26/–**	**29/–**
8	6½	3	**12/–**	**13/–**	**14/–**	**15/–**	**16/–**	**18/6**	**21/–**	**23/6**	**27/–**	**30/–**
9	—	3	**13/6**	**14/6**	**15/6**	**17/–**	**18/–**	**20/6**	**23/–**	**25/6**	**28/–**	**31/–**
10	—	3	**15/–**	**16/–**	**17/–**	**19/–**	**20/–**	**22/6**	**24/6**	**27/–**	**29/–**	**32/–**
12	—	3	**16/6**	**17/6**	**19/–**	**21/–**	**23/–**	**25/6**	**27/6**	**29/–**	**31/–**	**35/–**

Other sizes quoted for on receipt of specification. When ordering, please state flat or crown face. Reducing bushes are supplied free, when bores are required under standard sizes. Additional reducing bushes extra at **1/3** each. When bores are required above standard sizes, an extra charge of **2/6** per inch or part of an inch is made. Also made in special Aluminium Alloy—Prices List, plus 33⅓%.

Fig. 5508.

"EASEPHIX" DETACHABLE SPLIT FLANGES.

Can be used with all types of "Easephix" pulleys and placed in any position on the face of the pulley. Can also be fixed to any type of existing pulley with dismantling from shafting. When ordering please state belt face required.

Dia. of pulley, inches	3	4	5	6	7	8	9	10	12
Depth, inches	⅝	⅝	⅝	1	1	1	1	1¼	1¼
Width, inches	½	½	½	½	½	½	½	½	½
Price each	**4/–**	**4/9**	**5/6**	**6/3**	**7/–**	**7/9**	**8/6**	**9/3**	**11/–**

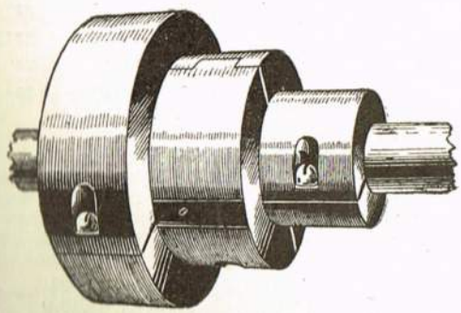

Fig. 5510. STEP CONE PULLEYS are made up from "Easephix" pulleys of the motor type, each step being interchangeable in one minute without disturbing the remaining steps.

Fig. 5509. "EASEPHIX" FAST AND LOOSE PULLEYS.

Can be made to run loose on shaft by using split bearing bushes and may be mounted with or without reducing bushes. When short bushes are required to minimise friction, collars can be fixed each end of loose bush.

Length of bushings, inches	3	4½	5¼	6	6¾	8¼
Length of bearing surface, inches	3	4½	4½	6	6	8¼

Bore	Outside Dia.	Prices.					
1″	1½″	**6/–**	**7/6**	**8/3**	**9/–**	**10/–**	**11/6**
1¼″	1¾″						
1½″	2″						
1¾″	2¼″	**8/–**	**10/–**	**11/–**	**12/–**	**13/3**	**15/–**
2″	2½″						
2¼″	2¾″						
2½″	3″	**10/–**	**12/6**	**13/9**	**15/–**	**16/6**	**18/6**
2¾″	3¼″						
3″	3½″						

For intermediate or longer bushings add 12½% per inch or part of an inch to the price of next standard size lower.

Intermediate bushings have bearing surface equal to the next standard size lower, the ends being extended clear of shaft.

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PULLEYS. COLLARS. SHAFTING.

"EAZEPHIX" PATENT SPLIT SET COLLARS.

In Malleable and Cast Iron.

Can be fitted without removing pulleys or bearings. Fitted with a hinged joint and set screw, slotted for turnscrew and tommy bar tightening. A firm grip is secured on the shaft. Accurately bored and turned. Made from 1″ to 6″ bore. Intermediate sizes same price of next larger size.

Diam. of shaft, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3
Diam. of collar overall inches	2⅝	2⅞	3⅛	3⅜	3⅝	3⅞	4⅛	4½	4¾
Width of collar, inches	1¼	1¼	1¼	1¼	1¼	1⅜	1⅜	1⅜	1½
Price of collar—									
Fig. 5511. Malleable iron ...	**4/3**	**4/3**	**4/6**	**5/3**	**6/–**	**6/9**	**7/6**	**8/3**	**9/–**
Fig. 5512. Cast iron	**3/6**	**3/6**	**3/9**	**4/–**	**4/3**	**4/6**	**4/9**	**5/3**	**6/–**

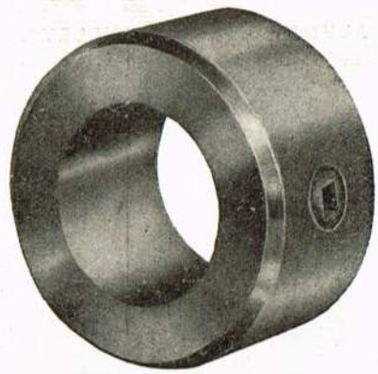

Fig. 5513. BRIGHT TURNED LOOSE COLLARS.

Best finish.

Accurate bore, with set screw or square set pins.

Inside diam., inches	½	⅝	¾	⅞	1	1⅛	1¼
Outside diam., inches	1	1¼	1⅜	1½	1¾	1⅞	2
Width, inches ...	½	⅝	¾	¾	⅞	⅞	1
Price each... ...	**–/11**	**1/–**	**1/1**	**1/2**	**1/3**	**1/5**	**1/7**
Inside diam., inches ...	1⅜	1½	1¾	2	2¼	2½	
Outside diam., inches ...	2¼	2⅜	2⅝	3	3¼	3⅝	
Width, inches	1	1	1⅛	1¼	1¼	1⅜	
Price each...	**1/9**	**1/11**	**2/3**	**2/7**	**3/–**	**3/6**	
Inside diam., inches ...	2¾	3	3¼	3½	3¾	4	
Outside diam., inches ...	3⅞	4¼	4½	4⅞	5⅛	5½	
Width, inches	1⅜	1½	1⅝	1¾	1¾	2	
Price each...	**4/2**	**4/9**	**5/9**	**6/9**	**7/9**	**9/–**	
Inside diam., inches ...	4¼	4½	4¾	5	5½	6	
Outside diam., inches ...	5¾	6⅛	6½	6¾	7¼	7¾	
Width, inches	2	2⅛	2⅛	2⅛	2¼	2¼	
Price each...	**10/6**	**12/–**	**13/9**	**15/6**	**19/6**	**25/–**	

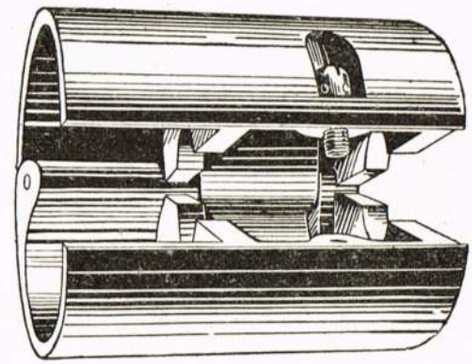

Fig. 5514. "EAZEPHIX" SPLIT MOTOR PULLEYS.

Will grip short length spindle or shaft. Turned all over. Key being unnecessary, this pulley can be securely fixed in one minute. 3″ to 6″ diameter pulleys up to 5″ face will grip spindle 2″ in length —6″ faces require spindle 3″ in length—7″ and 8″ faces require spindle 4″ in length, and have double screws—7″ to 8″ diameter pulleys require 4″ spindles for all faces and are fitted with two screws.

Diam. inches		Width of face. 3	4	5	6	7	8
3	...	**9/3**	**10/9**	**12/–**	**13/3**	—	—
3½	...	**10/3**	**11/6**	**12/9**	**14/3**	—	—
4	...	**10/9**	**12/–**	**13/3**	**14/9**	**18/–**	**22/–**
4½	...	**11/6**	**12/9**	**14/3**	**15/6**	**19/3**	**23/3**
5	...	**12/–**	**13/3**	**14/9**	**16/–**	**20/–**	**24/–**
5½	...	**12/9**	**14/3**	**15/6**	**17/3**	**21/3**	**25/3**
6	...	**13/3**	**14/9**	**16/–**	**18/–**	**22/–**	**26/–**
6½	...	—	—	**17/3**	**19/3**	**23/3**	**27/3**
7	...	—	—	**18/–**	**20/–**	**24/–**	**28/–**
8	...	—	—	**20/–**	**22/–**	**26/–**	**30/–**

Fig. 5520. BEST BRIGHT TURNED AND GROUND STEEL SHAFTING.

Round. Smooth. True to size. Absolutely straight.

Being round and straight it can be run at high speed without heating of bearings.

Diameter, inches	1	1¼	1½	1¾	2	2¼	2½	2¾			
Approx. weight per foot, lbs.	2.68	4.18	6.6	8.18	10.7	13.5	16.9	20.2			
Price per foot	**–/9**	**1/–**	**1/3**	**1/6**	**1/9**	**2/3**	**2/9**	**3/3**			
Diameter, inches	3	3¼	3½	4	4½	5	5½	6			
Approx. weight per foot, lbs.	24.1	28.3	32.2	37.6	42.7	66.8	80.78	96.13			
Price per foot	**3/10**	**4/6**	**5/3**	**7/–**	**9/6**	**12/–**	**15/–**	**17/6**			

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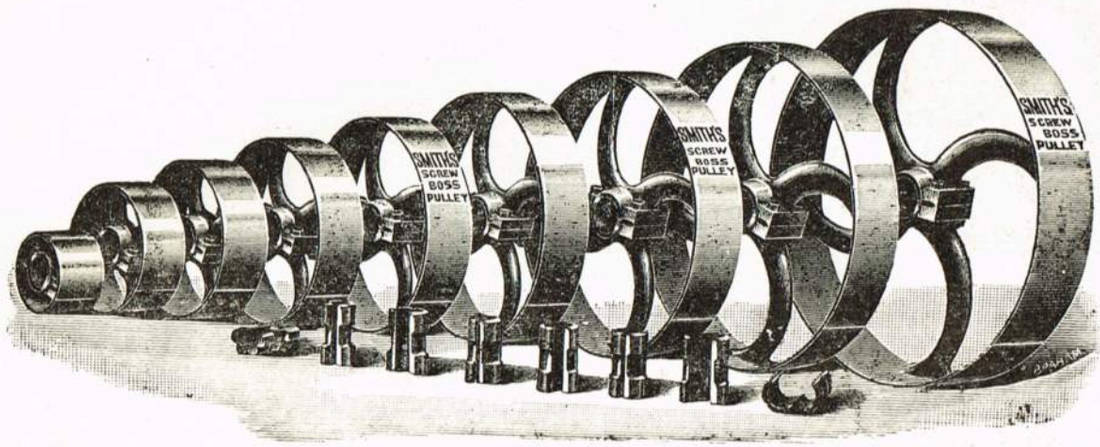
PULLEYS.

Fig. 5521. CAST-IRON SPLIT PULLEYS.

6″ to 24″ diameter, 3″ to 6″ wide on face, for shafts from 1⅛″ to 2″ diameter only.

"**O**" **Series**, with "Convertible" screw boss and interchangeable screw bush.



This Series of Screw Boss and Interchangeable Screw Bush has been specially designed for Pulleys from 6″ to 24″ diameter, 3″ to 6″ wide on face, and for Shafts from 1⅛″ to 2″ diameter.

WHOLE.

Diam. in ins.	Width of face in inches. 3	4	5	6
6	Under 4″ wide on face charged as 4″. Made to order only. Not kept in stock.	6/–	6/6	7/–
7		6/6	7/–	7/6
8		7/–	7/6	8/6
9		7/6	8/–	9/–
10		8/–	9/–	10/–
11		8/6	9/6	10/6
12		9/–	10/–	11/–
13		9/6	10/6	11/6
14		10/–	11/–	12/–
15		10/6	11/6	12/6
16		11/–	12/–	13/–
17		12/–	13/–	14/–
18		13/–	14/–	15/–
19		14/–	15/–	16/–
20		15/–	16/–	17/–
21		16/–	17/–	18/–
22		17/–	18/–	19/–
23		18/–	19/–	20/–
24		19/–	20/–	21/–

"O" Series.

6″ to 24″ diameter only.
3″ to 6″ wide on face only.
1⅛″ to 2″ bore only.

This Series cannot be supplied **over** 24″ diameter, 6″ wide on face, or 2″ bore.

Flat or rounded on face.

No extra charge for rounding.

SPLIT.

Diam. in ins.	Width of face in inches. 3	4	5	6
6	Under 4″ wide on face charged as 4″. Made to order only. Not kept in stock.	9/6	10/–	10/6
7		10/–	10/6	11/–
8		10/6	11/–	12/–
9		11/–	11/6	12/6
10		11/6	12/6	13/6
11		12/–	13/–	14/–
12		12/6	13/6	14/6
13		13/–	14/–	15/–
14		13/6	14/6	15/6
15		14/–	15/–	16/–
16		14/6	15/6	16/6
17		15/6	16/6	17/6
18		16/6	17/6	18/6
19		18/–	19/–	20/–
20		19/–	20/–	21/–
21		20/–	21/–	22/–
22		21/–	22/–	23/–
23		22/–	23/–	24/–
24		23/–	24/–	25/–

In ordering Pulleys, always say if Split or Whole, Flat or Rounded. Split Pulleys recommended. **Flat Face sent unless otherwise ordered.**

SCREW BOSS AND INTERCHANGEABLE SCREW BUSH.

It is impracticable to make one and the same pulley fit all diameters of shafts, therefore the boss and screwed hole of our Screw Boss Pulleys and the screw bush are made in series :

Series 0	for shafts from 1⅛″ to 2″ diameter	Price	**2**/– each.
Series 1	,, ,, 1½″ to 3″ ,, ...	,,	**3/6** ,,
Series 2	,, ,, 3″ to 4½″ ,, ...	,,	**5/6** ,,
Series 3	,, ,, 4½″ to 6″ ,, ...	,,	**7/6** ,,

The hole in all pulleys, for each respective series, is bored and screwed to a uniform diameter and taper, and the bush is of a corresponding diameter and taper outside. It will be obvious that a pulley can be fixed on shafts of twenty-five different diameters by the employment of a suitable bush ; for instance, if a pulley and bush is on a shaft, say 1½″ diameter, the same pulley may be used on a shaft of any diameter to 3″ (No. 1 Series), the only change necessary being a bush for the required shaft. This also applies to pulleys of No. 2 and No. 3 Series, for their respective range of shafts.

Prices quoted are for Standard sizes and lengths, and for pulleys to 12″ wide on face (inclusive). Bushes for pulleys over 12″ wide charged extra according to length and bore.

Pulleys ordered complete are always sent in series as above, but we can supply bushes for 2½″, 2¾″, 2⅞″, and 3″ shafts—No. 2 Series ; and 4″ and 4¼″ shafts—No. 3 Series ; when required for alterations.

In ordering bush give diameter of shaft, also diameter and length of screwed hole in pulley.

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PULLEYS.

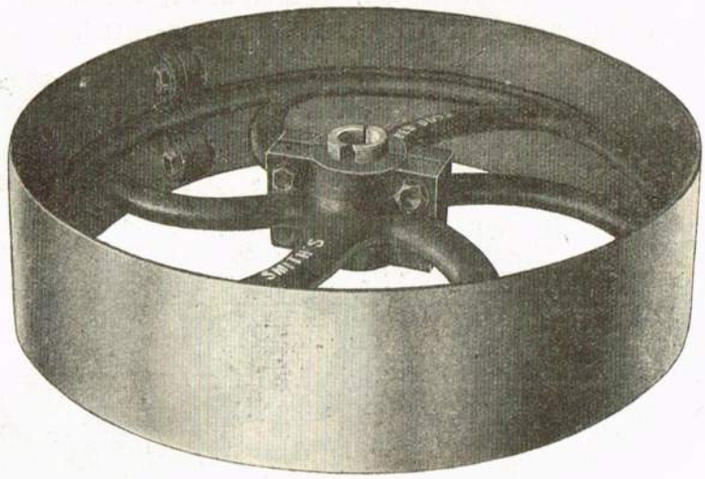

Fig. 5522. Cast-Iron Split Turned Pulleys with Patent Screw Boss and Screw Bush.

Diam. in Ins.	Width of Face in Inches. 4	5	6	7	8	9	10	11	12
7 ...	12/6	13/6	14/6	15/6	—	—	—	—	—
8 ...	12/6	13/6	14/6	15/6	16/6	—	—	—	—
9 ...	13/6	14/6	15/6	16/6	17/6	18/6	—	—	—
10 ...	14/6	15/6	16/6	17/6	18/6	19/6	21/6	—	—
11 ...	14/6	15/6	16/6	17/6	18/6	19/6	21/6	23/6	—
12 ...	15/6	16/6	17/6	18/6	19/6	20/6	22/6	24/6	26/6
13 ...	16/6	17/6	18/6	19/6	20/6	22/6	23/6	25/6	27/6
14 ...	17/6	18/6	19/6	20/6	22/6	23/6	24/6	26/6	28/6
15 ...	18/6	19/6	20/6	22/6	23/6	24/6	26/6	28/6	30/6
16 ...	19/6	20/6	21/6	23/6	24/6	26/6	28/6	30/6	32/6
17 ...	20/6	21/6	22/6	24/6	25/6	27/6	29/6	31/6	33/6
18 ...	20/6	21/6	22/6	24/6	26/6	28/6	30/6	32/6	34/6
19 ...	21/6	22/6	23/6	25/6	27/6	29/6	31/6	33/6	35/6
20 ...	22/6	23/6	25/6	27/6	29/6	31/6	33/6	35/6	37/6
21 ...	23/6	25/6	26/6	28/6	30/6	32/6	34/6	36/6	38/6
22 ...	23/6	25/6	27/6	29/6	31/6	33/6	35/6	37/6	39/6
23 ...	25/6	27/6	29/6	31/6	33/6	35/6	37/6	39/6	41/6
24 ...	25/6	28/6	30/6	32/6	34/6	36/6	38/6	40/6	43/6
25 ...	26/6	29/6	31/6	33/6	36/6	38/6	40/6	43/6	45/6
26 ...	27/6	30/6	33/6	35/6	37/6	39/6	41/6	44/6	47/6
27 ...	28/6	31/6	34/6	36/6	38/6	40/6	43/6	46/6	49/6
28 ...	29/6	32/6	35/6	38/6	40/6	42/6	45/6	48/6	51/6
29 ...	30/6	33/6	36/6	39/6	41/6	43/6	46/6	49/6	52/6
30 ...	32/6	35/6	38/6	41/6	43/6	45/6	48/6	51/6	54/6
31 ...	33/6	36/6	39/6	43/6	45/6	47/6	50/6	53/6	56/6
32 ...	34/6	37/6	40/6	44/6	46/6	48/6	51/6	54/6	57/6
33 ...	35/6	38/7	41/5	45/6	47/6	50/6	53/6	56/6	59/6
34 ...	36/6	39/6	42/6	46/6	48/6	52/6	55/6	58/6	61/6
35 ...	37/6	40/6	43/6	47/6	50/6	53/6	56/6	59/6	62/6
36 ...	38/6	41/6	44/6	48/6	51/6	54/6	57/6	60/6	63/6
37 ...	40/6	43/6	46/6	50/6	54/6	57/6	60/6	63/6	67/6
38 ...	41/6	44/6	47/6	51/6	55/6	58/6	61/6	65/6	68/6
39 ...	43/6	46/6	50/6	54/6	58/6	62/6	66/6	71/6	76/6
40 ...	45/6	48/6	52/6	56/6	60/6	64/6	69/6	74/6	79/6
42 ...	48/6	52/6	56/6	60/6	64/6	68/6	73/6	79/6	85/6
43 ...	49/6	53/6	57/6	61/6	65/6	69/6	75/6	81/6	87/6
44 ...	50/6	54/6	58/6	62/6	66/6	70/6	76/6	82/6	88/6
45 ...	52/6	56/6	60/6	64/6	68/6	72/6	78/6	84/6	91/6
46 ...	55/6	59/6	63/6	67/6	71/6	75/6	81/6	87/6	94/6
48 ...	57/6	61/6	65/6	69/6	73/6	78/6	84/6	90/6	97/6
50 ...	—	—	70/6	74/6	79/6	84/6	90/6	96/6	102/6
51 ...	—	—	72/6	77/6	82/6	87/6	93/6	99/6	105/6
52 ...	—	—	74/6	79/6	84/6	90/6	96/6	102/6	109/6
54 ...	—	—	77/6	82/6	87/6	93/6	99/6	106/6	113/6
57 ...	—	—	83/6	88/6	93/6	99/6	105/6	113/6	121/6
60 ...	—	—	89/6	94/6	99/6	105/6	111/6	119/6	129/6
63 ...	—	—	108/6	111/–	113/6	118/6	124/6	132/6	142/6
66 ...	—	—	116/6	119/–	121/6	126/6	132/6	142/6	152/6
69 ...	—	—	124/6	127/–	129/6	134/6	142/6	152/6	162/7
72 ...	—	—	132/6	135/–	137/6	142/6	152/6	162/6	172/6

Diam. in Ins.	Width of Face in Inches. 13	14	15	16	17	18	20	22	24
13 ...	30/6	—	—	—	—	—	—	—	—
14 ...	31/6	33/6	—	—	—	—	—	—	—
15 ...	33/6	35/6	38/6	—	—	—	—	—	—
16 ...	35/6	37/6	40/6	43/6	—	—	—	—	—
17 ...	36/6	39/6	42/6	45/6	48/6	—	—	—	—
18 ...	37/6	40/6	43/6	46/6	49/6	53/6	—	—	—
19 ...	38/6	41/6	44/6	47/6	51/6	55/6	—	—	—
20 ...	40/6	43/6	46/6	50/6	54/6	58/6	65/6	—	—
21 ...	41/6	44/6	48/6	52/6	56/6	60/6	68/6	—	—
22 ...	43/6	46/6	50/6	54/6	58/6	62/6	70/6	79/6	—
23 ...	46/6	49/6	53/6	57/6	61/6	65/6	73/6	83/6	—
24 ...	48/6	51/6	55/6	59/7	63/6	67/6	77/6	87/6	97/6
25 ...	49/6	52/6	56/6	60/6	65/6	70/6	80/6	90/6	100/6
26 ...	51/6	54/6	57/6	62/6	67/6	73/6	83/6	93/6	103/6
27 ...	53/6	57/6	61/6	65/6	70/6	76/6	86/6	96/6	106/6
28 ...	55/6	59/8	64/6	69/6	74/6	79/6	91/6	103/6	115/6
29 ...	57/6	62/6	67/6	72/6	77/6	83/6	95/6	107/6	119/6
30 ...	60/6	64/6	69/6	74/6	80/6	88/6	100/6	112/6	124/6
31 ...	62/6	67/6	72/6	78/6	84/6	91/6	103/6	115/6	128/6
32 ...	63/6	68/5	73/6	80/6	87/6	94/7	106/6	119/6	132/6
33 ...	66/6	71/6	76/6	82/6	89/6	97/6	110/6	123/6	136/6
34 ...	68/6	73/6	78/6	84/6	92/6	100/6	112/6	125/6	140/6
35 ...	70/6	76/6	82/6	88/6	95/6	103/6	115/6	129/6	144/6
36 ...	72/6	78/6	84/6	91/6	98/6	106/6	120/6	134/6	148/6
37 ...	77/6	82/6	87/6	94/6	100/6	108/6	122/6	138/6	154/6
38 ...	80/6	85/6	90/6	96/6	102/6	109/6	123/6	139/6	155/6
39 ...	84/6	89/6	94/6	100/6	106/6	112/6	126/6	142/6	160/6
40 ...	88/6	93/6	98/6	104/6	110/6	116/6	131/6	147/6	165/6
42 ...	93/6	98/6	103/6	110/6	117/6	124/6	139/6	155/6	173/6
43 ...	95/6	100/6	105/6	112/6	120/6	127/6	142/6	158/6	177/6
44 ...	97/6	102/6	107/6	114/6	122/6	130/6	145/6	161/6	180/6
45 ...	99/6	105/6	111/6	118/6	126/6	134/6	150/6	167/6	185/6
46 ...	102/6	108/6	115/6	122/6	130/6	138/6	155/6	173/6	192/6
48 ...	106/6	113/6	120/6	128/6	136/6	144/6	160/6	180/6	200/6
50 ...	112/6	120/6	128/6	136/6	144/6	153/6	171/6	181/6	212/6
51 ...	115/6	123/6	131/6	139/6	148/6	157/6	176/6	196/6	217/6
52 ...	118/6	126/6	134/6	143/6	153/6	163/6	183/6	203/6	223/6
54 ...	123/6	131/6	140/6	149/6	159/6	170/6	192/6	212/6	232/6
57 ...	132/6	140/6	149/6	159/6	170/6	184/6	209/6	228/6	247/6
60 ...	141/6	151/6	163/6	174/6	186/6	199/6	226/6	244/6	282/6
63 ...	154/6	165/6	177/6	189/6	203/6	217/6	245/6	263/6	283/6
66 ...	164/6	176/6	189/6	202/6	217/6	232/6	252/6	277/6	302/6
69 ...	175/6	187/6	201/6	216/6	232/6	248/6	268/6	295/6	323/6
72 ...	187/6	201/6	215/6	230/6	247/6	265/6	290/6	315/6	345/6

Above prices up to 36in. diameter include one bush bored any size from 1½in. to 3in. in diameter (Series 1).

Above prices from 38in. diameter and up include one bush bored any size from 1½in. to 4in. in diamtere (Series 1 and 2).

Extra for pulleys up to 36in. diameter bored to any size from 3in. to 4in. diameter (Series 2), add **2/–** to each pulley.

For pulleys above 36in. diameter bored any size from 4½in. to 6in. diameter (Series 3), add **3/6** to each pulley.

Pulleys made extra strong, add 25 per cent. to above prices. Flat or rounded on face, in ordering please state.

Cast-Iron Screw Boss and Interchangeable Screw Bush, Fast and Loose Whole Pulleys, self-contained. Self-fixing. Made in 2 Series, *i.e.*, Series 4 to take 1½in. to 2¼in. shafting, and Series 5 to take 2⅜in. to 3in. shafting. Made round or flat face.

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PULLEYS.

FIG. 1

FIG. 2

FIG. 3

CAST-IRON WHOLE TURNED PULLEYS with Patent Screw Boss and Screw Bush.

Fig. 5523.

The object of the invention is to provide simple means for mechanically fixing pulleys securely to spindles, without keyways, keys, or set-screws.

In carrying out the invention, we bore the central hole of the pulley conical, and screw the said hole internally. We provide a conical bush, turned and screwed externally, and adapted to fit the hole in the pulley. The said bush is split into four pieces, which are held together by our special process, forming a jointed bush or socket.

In reference to the accompanying illustrations, Fig. 1 is the section of a pulley having a conical and screw-threaded centre hole; Fig. 2 is an end view of the bush, open, ready to be placed on a shaft; Fig. 3 is a similar view to Fig. 2, but showing the bush placed on a shaft. Fig. 4 shows the shaft with a bush thereon and the pulley in position to be passed on to the same.

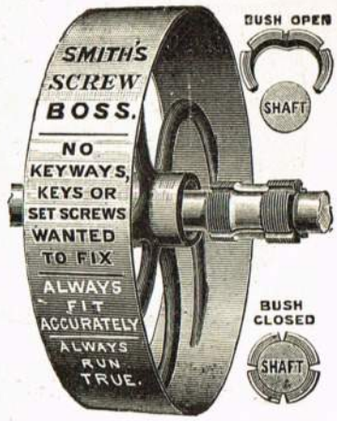

FIG 4.

To secure a pulley to a shaft by these improved means, it is simply necessary, the pulley being placed on the shaft, as Fig. 4, to open the divided and screw-threaded bush, as Fig. 2, and place the same on the shaft, as Figs. 3 and 4; and the pulley being rotated so as to screw its conical centre hole over the conical bush, the latter will be caused to firmly grip the shaft. The pulley is then securely fixed, ready for work, without keyway, key, or set-screw; and the greater the force transmitted, the tighter the bush will be caused to grip the shaft

Prices of Cast-Iron WHOLE Pulleys, Flat or Round Face.

Diam. Ins.	Width of Face in Inches. 4	5	6	7	8	9	10	11	12	Diam. Ins.
7	9/-	10/-	11/-	12/-	—	—	—	—	—	7
8	9/-	10/-	11/-	12/-	13/-	—	—	—	—	8
9½	10/-	11/-	12/-	13/-	14/-	15/-	—	—	—	9
10	11/-	12/-	13/-	14/-	15/-	16/-	18/-	—	—	10
11	11/-	12/-	13/-	14/-	15/-	16/-	18/-	20/-	—	11
12	11/-	12/-	13/-	14/-	15/-	16/-	18/-	20/-	22/-	12
13	12/-	13/-	14/-	15/-	16/-	18/-	19/-	21/-	23/-	13
14	13/-	14/-	15/-	16/-	18/-	19/-	20/-	22/-	24/-	14
15	14/-	15/-	16/-	18/-	19/-	20/-	22/-	24/-	26/-	15
16	15/-	16/-	17/-	19/-	20/-	22/-	24/-	26/-	28/-	16
17	16/-	17/-	18/-	20/-	21/-	23/-	25/-	27/-	29/-	17
18	16/-	17/-	18/-	20/-	22/-	24/-	26/-	28/-	30/-	18
19	17/-	18/-	19/-	21/-	23/-	25/-	27/-	29/-	31/-	19
20	17/-	18/-	20/-	22/-	24/-	26/-	28/-	30/-	32/-	20
21	18/-	20/-	21/-	23/-	25/-	27/-	29/-	31/-	33/-	21
22	18/-	20/-	22/-	24/-	26/-	28/-	30/-	32/-	34/-	22
23	20/-	22/-	24/-	26/-	28/-	30/-	32/-	34/-	36/-	23
24	20/-	23/-	25/-	27/-	29/-	31/-	33/-	35/-	38/-	24
25	21/-	24/-	26/-	28/-	31/-	33/-	35/-	38/-	40/-	25
26	22/-	25/-	28/-	30/-	32/-	34/-	36/-	39/-	42/-	26
27	23/-	26/-	29/-	31/-	33/-	35/-	38/-	41/-	44/-	27
28	24/-	27/-	30/-	33/-	35/-	37/-	40/-	43/-	46/-	28
29	25/-	28/-	31/-	34/-	36/-	38/-	41/-	44/-	47/-	29
30	26/-	29/-	32/-	35/-	37/-	39/-	42/-	45/-	48/-	30
31	27/-	30/-	33/-	37/-	39/-	41/-	44/-	47/-	50/-	31
32	28/-	31/-	34/-	38/-	40/-	42/-	45/-	48/-	51/-	32
33	29/-	32/-	35/-	39/-	41/-	44/-	47/-	50/-	53/-	33
34	30/-	33/-	36/-	40/-	42/-	46/-	49/-	52/-	55/-	34
35	31/-	34/-	37/-	41/-	44/-	47/-	50/-	53/-	56/-	35
36	32/-	35/-	38/-	42/-	45/-	48/-	51/-	54/-	57/-	36
37	34/-	37/-	40/-	44/-	48/-	51/6	54/-	57/-	61/-	37
38	35/-	38/-	41/-	45/-	49/-	52/-	55/-	59/-	62/-	38
39	36/-	39/-	43/-	47/-	51/-	55/-	59/-	69/-	69/-	39
40	38/-	41/-	45/-	49/-	53/-	57/-	62/-	67/-	72/-	40
42	41/-	45/-	49/-	53/-	57/-	61/-	66/-	72/-	78/-	42
43	42/-	46/-	50/-	54/-	58/-	62/-	68/-	74/-	80/-	43
44	43/-	47/-	51/-	55/-	59/-	63/-	69/-	75/-	81/-	44
45	45/-	49/-	53/-	57/-	61/-	65/-	71/-	77/-	84/-	45
46	48/-	52/-	56/-	60/-	64/-	68/-	74/-	80/-	87/-	46
48	50/-	54/-	58/-	62/-	66/-	71/-	77/-	83/-	90/-	48
50	—	—	61/-	65/-	70/-	75/-	81/-	87/-	93/-	50
51	—	—	63/-	68/	73/-	78/-	84/-	90/-	96/-	51
52	—	—	65/-	70/-	75/-	81/-	87/-	93/-	100/-	52
54	—	—	68/-	73/-	78/-	84/-	90/-	97/-	104/-	54
57	—	—	74/-	79/-	84/-	90/-	96/-	104/-	112/-	57
60	—	—	80/-	85/-	90/-	96/-	102/-	110/-	120/-	60
63	—	—	96/-	98/6	101/-	106/-	112/-	120/-	130/-	63
66	—	—	104/-	106/6	109/-	114/-	120/-	130/-	140/-	66
60	—	—	112/-	114/6	117/-	122/-	130/-	140/-	150/-	69
72	—	—	120/-	122/6	125/-	130/-	140/-	150/-	160/-	72

Diam. Ins.	Width of Face in Inches. 13	14	15	16	17	18	20	22	24	Diam. Ins.
13	25/-	—	—	—	—	—	—	—	—	13
14	26/-	28/-	—	—	—	—	—	—	—	14
15	28/-	30/-	33/-	—	—	—	—	—	—	15
16	30/-	32/-	35/-	38/-	—	—	—	—	—	16
17	31/-	34/-	37/-	40/-	43/-	—	—	—	—	17
18	32/-	35/-	38/-	41/-	44/-	48/-	—	—	—	18
19	33/-	36/-	39/-	42/-	46/-	50/-	—	—	—	19
20	34/-	37/-	40/-	44/-	48/-	52/-	59/-	—	—	20
21	35/-	38/-	42/-	46/-	50/-	54/-	62/-	—	—	21
22	37/-	40/-	44/-	48/-	52/-	56/-	64/-	73/-	—	22
23	39/-	42/-	46/-	50/-	54/-	58/-	66/-	76/-	—	23
24	41/-	44/-	48/-	52/-	56/-	60/-	70/-	80/-	90/-	24
25	42/-	45/-	49/-	53/-	58/-	63/-	73/-	83/-	93/-	25
26	44/-	47/-	50/-	55/-	60/-	66/-	76/-	86/-	96/-	26
27	46/-	50/-	54/-	58/-	63/-	69/-	79/-	89/-	99/-	27
28	48/-	52/-	57/-	62/-	67/-	72/-	84/-	96/-	108/-	28
29	50/-	55/-	60/-	65/-	70/-	76/-	88/-	100/-	112/-	29
30	52/-	56/-	61/-	66/-	72/-	80/-	92/-	104/-	116/-	30
31	54/-	59/-	64/-	70/-	76/-	83/-	95/-	107/-	120/-	31
32	55/-	60/-	65/-	72/-	79/-	86/-	98/-	111/-	124/-	32
33	58/-	63/-	68/-	74/-	81/-	89/-	102/-	115/-	128/-	33
34	60/-	65/-	70/-	76/-	84/-	92/-	104/-	117/-	132/-	34
35	62/-	68/-	74/-	80/-	87/-	95/-	107/-	121/-	136/-	35
36	64/-	70/-	76/-	83/-	90/-	98/-	112/-	126/-	140/-	36
37	68/-	73/-	78/-	85/-	91/-	99/-	113/-	129/-	145/-	37
38	71/-	76/-	81/-	87/-	93/-	100/-	114/-	130/-	146/-	38
39	74/-	79/-	84/-	90/-	96/-	102/-	116/-	132/-	150/-	39
40	78/-	83/-	88/-	94/-	100/-	106/-	121/-	137/-	155/-	40
42	83/-	88/-	93/-	100/-	107/-	114/-	129/-	145/-	163/-	42
43	85/-	90/-	95/-	102/-	110/-	117/-	132/-	148/-	167/-	43
44	87/-	92/-	97/-	104/-	112/-	120/-	135/-	151/-	170/-	44
45	89/-	95/-	101/-	108/-	116/-	124/-	140/-	157/-	175/-	45
46	92/-	98/-	105/-	112/-	120/-	128/-	145/-	163/-	182/-	46
48	96/-	103/-	110/-	118/-	126/-	134/-	150/-	170/-	190/-	48
50	100/-	108/-	116/-	124/-	132/-	141/-	159/-	179/-	200/-	50
51	103/-	111/-	119/-	127/-	136/-	145/-	164/-	184/-	205/-	51
52	106/-	114/-	122/-	131/-	141/-	151/-	171/-	191/-	211/-	52
54	111/-	119/-	128/-	137/-	147/-	158/-	180/-	200/-	220/-	54
57	120/-	128/-	137/-	147/-	158/-	172/-	197/-	216/-	235/-	57
60	129/-	139/-	151/-	162/-	174/-	187/-	214/-	232/-	250/-	60
63	139/-	150/-	162/-	174/-	188/-	202/-	230/-	248/-	268/-	63
66	149/-	161/-	174/-	187/-	202/-	217/-	237/-	262/-	287/-	66
69	160/-	172/-	186/-	201/-	217/-	233/-	253/-	280/-	308/-	69
72	172/-	186/-	200/-	215/-	232/-	250/-	275/-	300/-	330/-	72

Above prices up to 36″ diameter include one bush bored any size from 1½″—3″ diameter (Series 1).

Above prices from 38″ diameter and upwards include one bush bored any size from 1½″ to 4½″ diameter (Series 1 and 2).

Extras for pulleys up to 36″ diameter bored any size from 3 to 4½ inches diameter (Series 2), add **2/-** to each pulley,

For pulleys above 36″ diameter bored any size from 4½″ to 6½″ diameter (Series 3), add **3/6** to each pulley.

For pulleys extra strong, at 25% to above prices.

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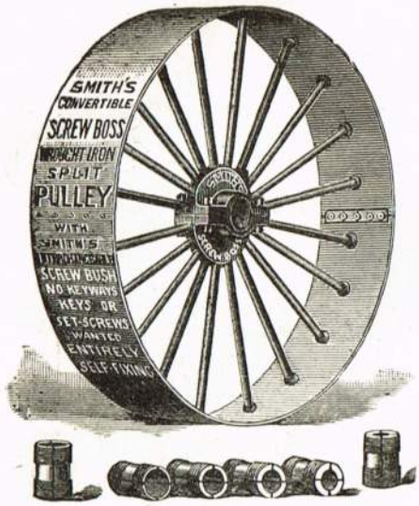

PULLEYS.

Fig. 5524. SMITH'S "CONVERTIBLE" SCREW BOSS AND INTERCHANGEABLE SCREW BUSH WROUGHT-IRON SPLIT PULLEYS.

Single-armed.

Specially adapted for export, as no keys nor set-screws are required. Can be fitted to different diameters of shafting by the simple method of changing the bush.

	Diam. in Ins.	Width of Face in Inches. 4	5	6	7	8	9	10	11	12	Diam. in Ins.
These Prices include One Bush bored any size from 1½ to 3ins. diam. (No. 1 Series). For Bores over 3 ins. and to 4½ ins. diam. (No. 2 Series) add 3/6 each Pulley	16	20/6	22/–	23/–	25/–	26/6	29/–	31/–	32/6	34/6	16
	18	22/6	24/6	26/6	28/–	29/6	31/–	33/–	35/–	37/–	18
	20	24/6	27/–	29/–	31/–	32/6	34/–	35/6	37/6	39/6	20
	22	26/6	30/–	32/–	34/–	36/–	38/–	40/–	42/–	44/–	22
	24	30/–	32/–	34/6	36/6	38/6	40/6	42/6	44/6	46/6	24
	26	32/6	35/–	37/6	39/6	41/6	44/–	46/–	48/–	50/6	26
	28	36/6	38/–	40/–	42/6	45/–	47/–	50/–	52/–	54/–	28
	30	38/–	41/–	42/6	45/–	47/–	49/–	51/6	54/–	57/6	30
	32	40/–	43/–	45/–	47/6	50/–	52/6	55/–	57/6	60/–	32
	34	42/6	45/–	47/6	50/–	52/6	55/–	57/6	60/–	62/6	34
	36	45/–	47/6	50/–	52/6	55/–	57/6	60/–	62/6	65/6	36
	38	50/6	54/–	56/–	57/6	60/–	62/6	65/6	69/6	72/6	38
	40	52/6	56/–	58/6	61/6	64/6	67/6	71/6	74/6	77/6	40
	42	55/–	59/–	62/–	65/–	68/–	71/–	75/–	78/–	82/6	42
	44	61/6	66/–	68/6	72/6	74/6	77/6	81/6	85/6	88/6	44
	46	65/6	68/6	71/6	74/6	77/6	80/6	84/6	88/6	92/6	46
These Prices include One Bush bored any size from 1½ to 4½ ins. diam. (Nos. 1 and 2 Series). For Bores over 4½ ins. and to 6 ins. diam. (No. 3 Series) add 5/– each Pulley.	48	68/6	71/6	74/–	76/6	79/6	82/6	86/6	90/6	94/6	48
	50	71/6	75/6	78/6	81/6	84/6	87/6	91/6	95/6	99/6	50
	52	75/6	79/6	82/6	86/6	89/6	92/6	96/6	100/6	104/6	52
	54	78/6	83/6	86/6	90/6	94/6	97/6	101/6	105/6	109/6	54
	56	83/6	87/6	91/6	95/6	99/6	102/6	106/6	110/6	114/6	56
	58	87/6	91/6	95/6	100/6	104/6	108/6	112/6	115/6	119/6	58
	60	92/6	96/6	100/6	105/6	109/6	114/6	118/6	122/6	126/6	60
	62	97/6	101/6	105/6	110/6	114/6	119/6	123/6	128/6	132/6	62
	64	102/6	107/6	111/6	116/6	120/6	125/6	129/6	134/6	138/6	64
	66	108/6	113/6	117/6	122/6	126/6	131/6	135/6	140/6	144/6	66
	68	115/6	119/6	123/6	128/6	132/6	137/6	141/6	146/6	150/6	68
	70	121/6	125/6	129/6	133/6	138/6	143/6	147/6	152/6	156/6	70
	72	127/6	131/6	136/6	141/6	145/6	149/6	154/6	158/6	162/6	72
These Prices include One Bush bored any size to 6 ins. diam.	74	134/6	138/6	142/6	147/6	152/6	156/6	160/6	164/6	168/6	74
	76	142/6	146/6	150/6	155/6	159/6	162/6	167/6	170/6	174/6	76
	78	151/6	155/6	158/6	162/6	166/6	170/6	174/6	177/6	181/6	78
	80	159/6	163/6	166/6	170/6	174/6	178/6	181/6	184/6	188/6	80
	82	167/6	171/6	174/6	178/6	182/6	186/6	189/6	192/6	196/6	82
	84	175/6	179/6	182/6	186/6	190/6	194/6	198/6	201/6	205/6	84
	86	183/6	186/6	190/6	194/6	198/6	202/6	206/6	210/6	214/6	86
	88	190/6	194/6	198/6	203/6	207/6	211/6	215/6	219/6	223/6	88
	90	198/6	202/6	206/6	211/6	215/6	219/6	224/6	228/6	232/6	90
	92	206/6	210/6	214/6	219/6	224/6	228/6	233/6	238/6	242/6	92
	94	214/6	218/6	222/6	227/6	232/6	237/6	242/6	247/6	252/6	94
	96	222/6	226/6	230/6	236/6	241/6	246/6	252/7	257/6	262/6	96
	98	230/6	234/6	238/6	244/6	250/6	255/6	261/6	266/6	272/6	98
	100	238/6	242/6	246/6	252/6	258/6	264/6	270/6	276/6	282/6	100
	102	245/6	249/6	254/6	261/6	267/6	273/6	280/6	286/6	292/6	102
	104	252/6	257/6	262/6	269/6	276/6	282/6	289/6	296/6	302/6	104
	106	260/6	265/6	270/6	278/6	285/6	292/6	299/6	306/6	313/6	106
	108	267/6	272/6	278/6	286/6	294/6	301/6	309/6	316/6	324/6	108
	110	274/6	280/6	286/6	294/6	303/6	311/6	319/6	327/6	335/6	110
	112	282/6	288/6	294/6	303/6	312/6	320/6	329/6	337/6	346/6	112
	114	290/6	296/6	302/6	312/6	321/6	330/6	339/6	348/6	357/6	114
	116	298/6	304/6	310/6	320/6	330/6	340/6	349/6	359/6	368/6	116
	118	306/6	313/6	320/6	331/6	341/6	350/6	360/6	370/6	380/6	118
	120	315/6	324/6	332/6	342/6	352/6	361/6	371/6	382/6	392/6	120

Flat or Rounded on face without Extra Charge. Flat Face always sent unless otherwise ordered.

Double-armed Pulleys. If the breadth of face is more than 12 ins. we recommend two sets of Arms. Prices are calculated and charged as follows; A 36ins. diam. by 14 ins. face would be same as **two** 36 ins. diam. with 7 ins. face; if, however, the Pulley has 12 ins. face or under, and still wished Double-armed for heavy work, the price is not charged less than **two** 6 ins. faces, the cost of workmanship being the same.

Intermediate diameters and widths. can be supplied.

We must be specially informed with order if a pulley has to do heavy work or to be fixed near gearing.

Extra Strong Single-armed Pulleys can be made at a small additional cost if the work is heavy; and it is always well to be on the right side

Wrought-Iron Pulleys supplied to 20 ft. diameter. Prices from 10 ft. diameter on application.

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DYNAMO PULLEYS.

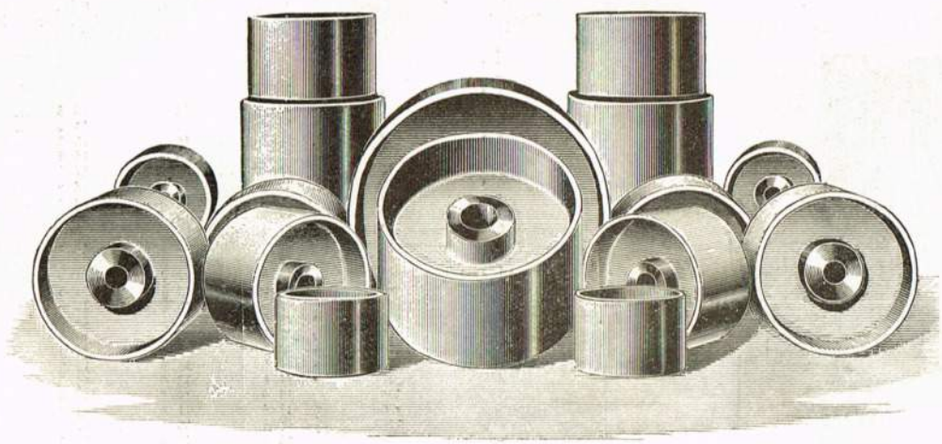

Fig. 5525. DYNAMO PULLEYS.

These Pulleys have been specially designed for use on Dynamos, Saw Benches and other machines requiring accurately balanced pulleys for high speeds.

They are made of cast iron, with a solid web instead of arms, turned all over, painted inside, polished on face, and can be supplied with keyway or set screw, either or neither of which unless specially ordered, will be provided at our option.

They will always be supplied with **rounded** faces unless otherwise ordered.

We can make intermediate diameters and widths, or thicken the rims and webs of these Pulleys, but any variation from the dimensions given will be charged extra. Prices on receipt of specification.

Larger Dynamo Pulleys than those given in table can be quoted for up to 60 inches diameter by 36 inches wide.

A small extra charge if made fast and loose.

Diam. Ins.	Max. Bore. Ins.	WIDTH ON FACE. 4 ins.	5ins.	6ins.	7ins.	8ins.	9ins.	10ins.	11ins.	12ins.
3½	2	6/9	7/9	8/9	10/–	11/6	13/3	15/3	—	—
4	2	7/–	8/–	9/–	10/3	11/9	13/6	15/6	—	—
4½	2	7/3	8/3	9/3	10/6	12/–	13/9	15/9	—	—
5	2	7/6	8/6	9/6	10/9	12/3	14/–	16/–	18/6	20/6
5½	2	7/9	8/9	10/–	11/3	12/9	14/6	16/9	19/–	21/3
6	3	8/3	9/3	10/3	11/6	13/3	15/3	17/3	19/9	22/–
6½	3	8/6	9/6	10/9	12/–	13/9	15/9	18/–	20/6	23/–
7	3	9/–	10/–	11/3	12/9	14/6	16/6	18/9	21/3	23/9
7½	3	9/3	10/6	11/6	13/3	15/–	17/3	19/6	22/–	24/6
8	3	9/9	10/6	12/3	13/9	15/9	18/–	20/3	22/8	25/3
8½	3	10/–	11/3	12/9	14/6	16/6	18/9	21/–	23/6	26/–
9	3	10/6	11/9	13/3	15/–	17/–	19/3	21/9	24/3	26/9
9½	3	10/9	12/3	13/9	15/9	17/9	20/–	22/6	25/–	27/6
10	3	11/3	12/6	14/6	16/6	18/6	20/9	23/3	25/9	28/6
10½	3	11/6	13/–	15/–	17/–	19/3	21/6	23/9	26/6	29/3
11	3	12/3	13/9	15/6	17/9	19/9	22/–	24/6	27/3	30/3
11½	3	12/9	14/3	16/3	18/6	20/9	22/9	25/6	28/3	31/3
12	3	13/6	15/–	17/–	19/3	21/6	23/9	26/3	29/3	32/3
13	4	14/6	16/3	18/3	20/6	23/–	25/3	28/–	31/–	34/–
14	4	15/9	17/6	19/9	22/–	24/6	27/–	29/9	32/9	36/–
15	4	17/–	18/9	21/–	23/6	26/–	28/6	31/6	34/6	37/9
16	4	18/3	20/3	22/6	24/9	27/6	30/3	33/–	36/6	39/9
17	4	19/6	21/6	23/9	26/3	29/–	31/9	34/9	38/–	41/9
18	4	20/9	22/9	25/–	27/6	30/6	33/6	36/6	40/–	43/6
19	4	22/–	24/–	26/6	29/–	32/–	35/–	38/3	41/9	45/6
20	4	23/3	25/3	27/9	30/6	33/6	36/6	39/9	43/6	47/3
21	4	24/6	26/9	29/–	32/–	35/–	38/3	41/6	45/3	49/3
22	4	25/6	27/9	30/6	33/3	36/6	39/9	43/3	47/–	51/3
23	4	26/9	29/–	31/9	34/9	38/–	41/6	45/–	48/9	53/–
24	4	28/–	30/6	33/–	36/3	39/6	43/–	46/6	50/6	55/–

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PULLEYS.

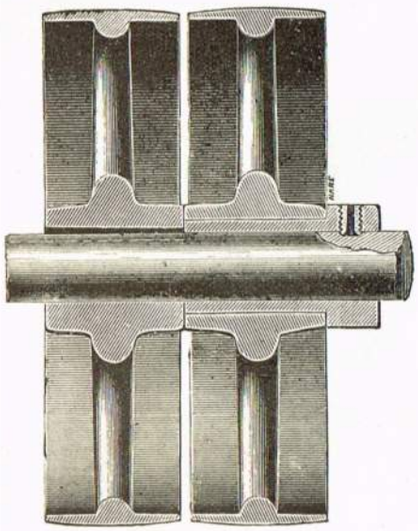


Fig. 5526. Cast Iron Fast and Loose Pulleys.

Diam. Ins.	2 in. Max. Bore 1½ in.	3 in. Max. Bore 2 in.	4 in. Max. Bore 3 in.	5 in. Max Bore. 3 in.	6 in. Max. Bore 3 in.	7 in. Max. Bore 3 in.	8 in. Max. Bore. 3 in.
	WIDTH OF EACH PULLEY.						
3	3/–	—	—	—	—	—	—
3½	3/6	—	—	—	—	—	—
4	4/–	5/–	—	—	—	—	—
5	4/6	5/6	—	—	—	—	—
6	5/–	6/–	11/–	12/–	13/6	—	—
7	5/8	7/–	12/–	13/–	14/6	18/6	—
8	6/4	8/–	12/6	14/–	15/6	20/6	23/6
9	7/–	9/–	13/6	15/–	16/6	21/6	24/6
10	7/8	10/–	14/6	16/–	17/6	23/6	26/6
11	8/4	10/6	15/6	17/–	18/6	24/6	27/6
12	9/–	11/–	16/6	18/–	19/6	26/6	29/6
13	9/8	12/–	17/–	18/6	20/–	27/6	30/6
14	10/4	12/6	17/6	19/–	20/6	28/6	31/6
15	11/–	13/6	18/6	20/–	21/6	29/6	32/6
16	11/8	14/6	19/6	21/–	22/6	30/6	33/5
17	12/4	15/–	20/6	22/6	24/6	32/6	35/6
18	13/–	16/–	22/6	24/–	25/6	34/6	37/6
19	13/8	17/–	24/6	26/–	27/6	36/6	40/6
20	14/4	18/–	25/6	27/–	28/6	38/6	42/6
21	15/–	19/–	27/6	28/6	29/6	40/6	44/6
22	16/–	20/–	28/6	30/–	31/6	44/6	48/6
23	17/–	21/–	29/6	31/6	33/6	46/6	50/6
24	18/–	22/–	31/6	33/6	35/6	48/6	53/6
25	No	24/–	34/6	37/6	39/6	52/6	57/6
26	Pattern	26/–	37/6	41/6	43/6	54/6	59/6
27	above	31/–	41/6	45/6	47/6	56/6	61/6
28	24 in.	36/–	45/6	49/6	51/6	58/6	63/6
29	—	38/6	49/6	51/6	56/6	60/6	65/6
30	—	41/–	51/6	53/6	58/6	62/6	67/6
31	—	No.	53/6	57/6	61/6	65/6	69/6
32	—	Pattern	55/6	59/6	63/6	67/6	71/6
33	—	above	57/6	61/6	65/6	70/6	75/6
34	—	30 ins.	59/6	63/6	67/6	72/6	77/6
35	—	—	61/6	65/6	69/6	74/6	79/6
36	—	—	63/6	67/6	71/6	76/6	81/6

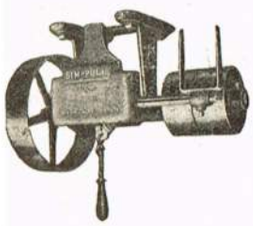
NOTE.—Pulleys 2in. and 3in. wide bored above maximum given, or with sleeve the diameter of which is larger than maximum bore, will be made from wider patterns and charged accordingly.

Fig. 5526A. Prices of whole Cast-Iron Sleeves, including Safety Set Screw.

Diameter of Shaft, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4
Price, Length of Back, 2 inches	2/3	2/3	2/6	—	—	—	—	—	—	—	—	—
" " 3 "	2/6	2/6	2/9	3/–	3/3	3/6	—	—	—	—	—	—
" " 4 "	2/9	2/9	3/–	3/3	3/6	3/9	4/–	4/3	—	—	—	—
" " 6 "	—	3/6	3/6	3/9	4/–	4/3	4/6	4/9	5/–	6/–	6/9	8/–
" " 8 "	—	—	—	4/3	4/6	5/–	5/3	5/6	6/–	6/6	7/6	9/–
" " 10 "	—	—	—	—	—	—	6/–	6/6	7/–	7/6	8/6	10/6
" " 12 "	—	—	—	—	—	—	—	—	8/–	8/6	9/6	12/–
Diameter of Back, inches	1½	1¾	2⅛	2⅜	2⅝	2⅞	3⅛	3¼	3¾	4	4¼	5
Diameter of Collar, inches	2	2¼	2⅝	2⅞	3¼	3½	3¾	4⅛	4½	4¾	5	5¾
Width of Collar, inches	1	1	1⅛	1⅛	1⅛	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜
Size of Screw, inches	½	½	½	½	½	⅝	⅝	⅝	⅝	¾	¾	¾

Oil Tubes fitted to Loose Pulleys, **1/3** each extra.

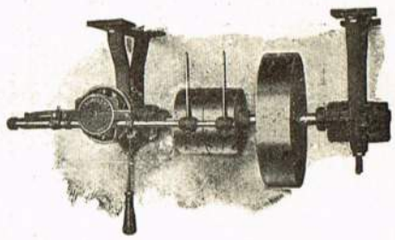
COUNTERSHAFT.



Countershafts can be advantageously employed with practically any kind of machine, when there is repeated starting and stopping. Their use gives an ease of operation which is appreciated by the worker and results in increased production, together with the elimination of accidents.

Efficiency of lubrication and freedom from dripping and spattering oil are features which will appeal to all users, particularly in food and textile factories. The loose pulleys are fitted with Arguto oil-less bushes, which require no oil, although not injured by its use.

The belt shifting device is simple and positive. The extent of pull is short, and if the handle is pulled more than halfway the reaction of the return spring completes the movement.



Pull to start. Sizes 8 to 12.

Fig. 5527. COUNTERSHAFT.

Pull to stop. Sizes 14 to 18.

	Size.	Tight and loose pulleys Diam. and face. ins.	Driving pulley. Diam. and face. ins.	Drop of hanger. ins.	Diam. of shaft. ins.	Price. £	s.	d.
Single Hanger—	8	4 × 1¾	8 × 1¾	7	⅞	3	12	0
	10	5 × 2¼	10 × 2¼	7	⅞	4	1	0
	12	6 × 2¾	12 × 2¾	8	15/16	5	0	0
Two Hangers—	14	7 × 3¼	14 × 3¼	10	1 5/16	9	0	0
	16	8 × 3¾	16 × 3¾	10	1 5/16	9	12	0
	18	9 × 4¼	8 × 4¼	10	1 7/16	10	10	0

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PLUMMER BLOCKS, Etc.

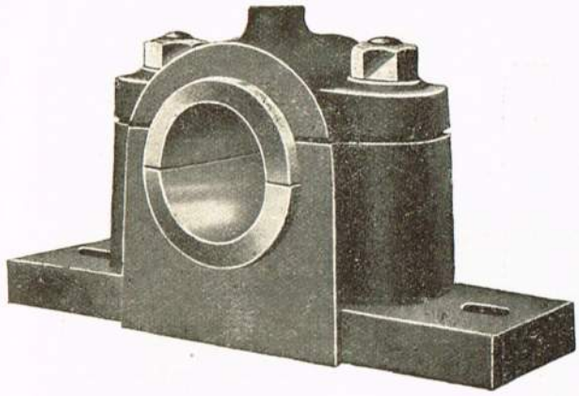

Fig. 5530. LIGHT SERIES.

Neat design, and fitted with good quality brasses. A perfect article at a reduced price. Length of brasses equal to $1\frac{1}{2}$ diameters. **Not** machined on base.

Size of bore, inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
Length of sole, inches	$6\frac{1}{4}$	$7\frac{1}{4}$	$8\frac{1}{4}$	$9\frac{5}{16}$	10	$10\frac{3}{4}$
Width of sole, inches	$1\frac{1}{16}$	$1\frac{3}{8}$	$1\frac{3}{4}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{11}{16}$
Centre of bolt holes, ins.	$5\frac{1}{8}$	6	$6\frac{3}{4}$	$7\frac{5}{8}$	$8\frac{1}{4}$	$8\frac{3}{4}$
Height to centre, inches	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
Price each ...	**2/9**	**3/3**	**3/9**	**4/9**	**6/–**	**8/–**
Size of bore, inches	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4
Length of sole, inches	$11\frac{1}{2}$	$12\frac{3}{8}$	$13\frac{1}{16}$	$13\frac{3}{4}$	$14\frac{1}{2}$	16
Width of sole, inches	3	$3\frac{5}{16}$	$3\frac{5}{8}$	$3\frac{15}{16}$	$4\frac{1}{4}$	$4\frac{7}{8}$
Centre of bolt holes, ins.	$9\frac{3}{8}$	$10\frac{1}{4}$	$10\frac{7}{8}$	$11\frac{1}{2}$	12	$13\frac{1}{2}$
Height to centre, inches	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{4}$	4
Price each ...	**10/6**	**13/6**	**16/–**	**20/–**	**24/–**	**34/–**

Fig. 5531. LIGHT SERIES.

As above but machined on base.

Price each ...	**3/–**	**3/6**	**4/6**	**5/6**	**7/–**	**9/–**
Price each ...	**11/6**	**14/6**	**17/6**	**21/–**	**26/–**	**36/–**

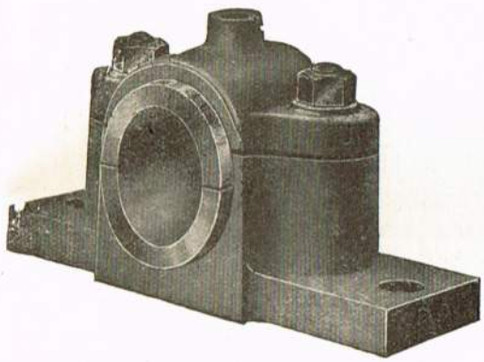

Fig. 5532. LIGHT SERIES.

Length of brasss equal to $1\frac{1}{2}$ diameters. **Machined** on base.

Size of bore, inches	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$
Length of sole, inches	$5\frac{1}{2}$	$5\frac{3}{4}$	$6\frac{1}{4}$	$7\frac{1}{4}$	$7\frac{1}{4}$	$7\frac{1}{4}$
Width of sole, inches	$\frac{15}{16}$	$\frac{15}{16}$	$1\frac{1}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{9}{13}$
Centres of bolt holes, ins.	$4\frac{3}{8}$	$4\frac{1}{2}$	$5\frac{1}{8}$	6	6	6
Height of centre from sole, inches ...	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{9}{16}$
Price each ...	**2/9**	**2/9**	**3/–**	**3/3**	**3/6**	**4/–**
Size of bore, inches	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$2\frac{1}{4}$
Length of sole, inches	$8\frac{1}{4}$	$8\frac{1}{4}$	$9\frac{5}{16}$	$9\frac{5}{16}$	10	$10\frac{3}{4}$
Width of sole, inches...	$1\frac{3}{4}$	$1\frac{15}{16}$	$2\frac{1}{16}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{11}{16}$
Centres of bolt holes, ins.	$6\frac{3}{4}$	$6\frac{3}{4}$	$7\frac{5}{8}$	$7\frac{5}{8}$	$8\frac{1}{4}$	$8\frac{3}{4}$
Height of centre from sole, inches ...	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{13}{16}$	$1\frac{15}{16}$	2	$2\frac{3}{8}$
Price each ...	**4/6**	**5/–**	**5/6**	**6/3**	**7/–**	**9/–**
Size of bore, inches	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4
Length of sole, inches	$11\frac{1}{2}$	$12\frac{3}{8}$	$13\frac{1}{16}$	$13\frac{3}{4}$	$14\frac{1}{2}$	16
Width of sole, inches	3	$3\frac{5}{16}$	$3\frac{5}{8}$	$3\frac{15}{16}$	$4\frac{1}{4}$	$4\frac{7}{8}$
Centres of bolt holes, ins.	$9\frac{3}{8}$	$10\frac{1}{4}$	$10\frac{7}{8}$	$11\frac{1}{2}$	12	$13\frac{1}{2}$
Height of centre from sole, inches ...	$2\frac{7}{16}$	$2\frac{11}{16}$	$2\frac{7}{8}$	$3\frac{3}{16}$	$3\frac{3}{8}$	$3\frac{7}{8}$
Price each ...	**11/6**	**14/6**	**17/6**	**21/–**	**26/–**	**36/–**

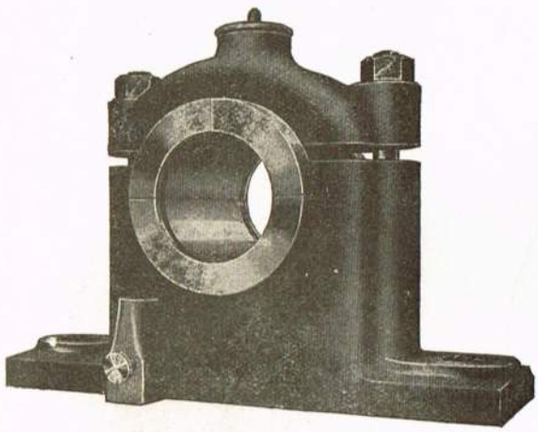

Fig. 5533. SELF-OILING PLUMMER BLOCKS.

Of good heavy design, fitted with gun-metal bearings, grooved for oil, brass rings for lubrication and feed, and drain holes.

Bore, inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2
Length of base, inches ...	$6\frac{1}{4}$	$7\frac{1}{4}$	$8\frac{1}{4}$	$9\frac{1}{4}$	10
Width of base, inches ...	$1\frac{3}{8}$	$1\frac{11}{16}$	$1\frac{15}{16}$	$2\frac{1}{8}$	$2\frac{3}{8}$
Bolt centres, inches	$5\frac{1}{8}$	6	$6\frac{3}{4}$	$7\frac{5}{8}$	$8\frac{1}{4}$
Height from sole to centre, inches	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{4}$	$2\frac{3}{4}$	3
Price each	**5/9**	**6/9**	**8/6**	**11/3**	**13/9**
Bore, inches		$2\frac{1}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Length of base, inches		$10\frac{3}{4}$	$11\frac{1}{2}$	$13\frac{1}{16}$	$14\frac{1}{2}$
Width of base, inches		$2\frac{3}{4}$	3	$3\frac{1}{2}$	4
Bolt centres		$8\frac{3}{4}$	$9\frac{3}{8}$	$10\frac{7}{8}$	12
Height from sole to centre, inches ...		$3\frac{1}{2}$	4	$4\frac{7}{8}$	$5\frac{1}{4}$
Price each		**17/9**	**22/3**	**34/–**	**51/–**

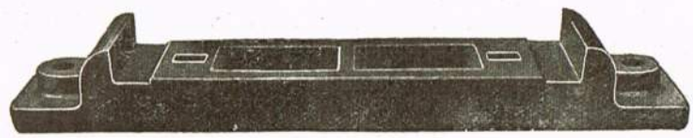

Fig. 5534. SILL PLATES, planed for Plummer Blocks.

Will take plummer block up to, inches ...	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3
Length of base, inches	$12\frac{3}{4}$	$14\frac{1}{2}$	16	18	$19\frac{1}{8}$	$20\frac{3}{4}$	22
Width of base, inches ...	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{3}{4}$	3	$3\frac{3}{8}$	$3\frac{3}{4}$
Thickness of base, inches	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$
Bolt centres, inches ...	$10\frac{3}{4}$	$12\frac{1}{4}$	$13\frac{1}{2}$	$15\frac{1}{2}$	$16\frac{5}{8}$	18	19
Price each	**3/–**	**3/6**	**4/–**	**5/–**	**6/–**	**7/–**	**8/–**

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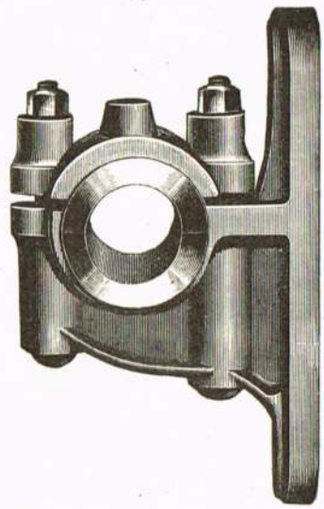
PLUMMER BLOCKS.

Fig. 5535. BRACKET BEARINGS, for bolting direct to upright posts, etc. Planed on base. Bored, faced and fitted with Top and Bottom Brasses. Length of brasses equal to $1\frac{1}{2}$ diameters plus $\frac{5}{8}$in.



Size of Bore. ins.	Price. each.	Distance from Centre to Base. ins.	Length of Base. ins.	Width of Base. ins.	Centres of Bolt Holes. ins.	Size of Holding-up Bolts. ins.	Thickness of Base at Bolt Holes. ins.	Distance from Top of Base to Centre. ins.
1	**6**/–	$3\frac{1}{16}$	$8\frac{1}{8}$	$1\frac{3}{4}$	$6\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$3\frac{7}{16}$
$1\frac{1}{4}$	**6**/–	$3\frac{1}{16}$	$8\frac{1}{8}$	$1\frac{3}{4}$	$6\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$3\frac{7}{16}$
$1\frac{1}{2}$	**7/6**	$3\frac{9}{16}$	$9\frac{1}{4}$	2	$7\frac{1}{4}$	$\frac{5}{8}$	$\frac{11}{16}$	4
$1\frac{3}{4}$	**10**/–	$3\frac{13}{16}$	10	$2\frac{3}{8}$	$8\frac{1}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$4\frac{3}{16}$
2	**12**/–	$4\frac{3}{8}$	$11\frac{1}{2}$	$2\frac{3}{4}$	$9\frac{5}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	$4\frac{7}{8}$
$2\frac{1}{4}$	**15/6**	$4\frac{5}{8}$	$12\frac{1}{4}$	3	$10\frac{1}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$5\frac{1}{16}$
$2\frac{1}{2}$	**18**/–	$4\frac{13}{16}$	$13\frac{3}{8}$	$3\frac{1}{4}$	$10\frac{7}{8}$	$\frac{3}{4}$	$\frac{15}{16}$	$5\frac{1}{2}$
$2\frac{3}{4}$	**22/6**	$5\frac{1}{2}$	$14\frac{1}{4}$	$3\frac{5}{8}$	$11\frac{13}{16}$	$\frac{7}{8}$	$1\frac{1}{8}$	6
3	**27/6**	6	$16\frac{1}{4}$	4	$13\frac{9}{16}$	$\frac{7}{8}$	$1\frac{3}{16}$	$6\frac{11}{16}$
$3\frac{1}{4}$	**33**/–	$6\frac{3}{8}$	$17\frac{1}{2}$	$4\frac{1}{4}$	14	1	$1\frac{3}{8}$	$7\frac{1}{4}$
$3\frac{1}{2}$	**44**/–	$6\frac{3}{4}$	$18\frac{1}{4}$	$4\frac{7}{16}$	$14\frac{3}{4}$	1	$1\frac{7}{16}$	$7\frac{1}{2}$
4	**57/6**	$7\frac{3}{4}$	21	5	17	$1\frac{1}{4}$	$1\frac{5}{8}$	$8\frac{1}{2}$
$4\frac{1}{2}$	**72**/–	$8\frac{1}{2}$	$21\frac{1}{2}$	$5\frac{3}{8}$	18	$1\frac{1}{4}$	$1\frac{3}{4}$	$8\frac{1}{4}$
5	**96**/–	$9\frac{1}{2}$	24	$6\frac{1}{2}$	20	$1\frac{1}{2}$	2	$9\frac{1}{2}$
$5\frac{1}{2}$	**120**/–	$10\frac{3}{4}$	25	$6\frac{1}{2}$	21	$1\frac{1}{2}$	$2\frac{3}{8}$	10
6	**145**/–	12	26	7	22	$1\frac{1}{2}$	$2\frac{1}{2}$	$10\frac{1}{2}$

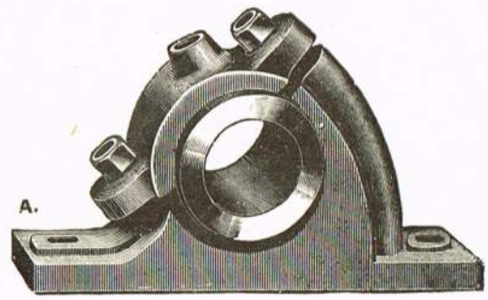


Fig. 5536. ANGLE PLUMMER BLOCKS, planed on sole, bored, faced, and fitted with Top and Bottom Brasses. Length of brasses equal to $1\frac{1}{2}$ diameters.

Size of Bore. ins.	Price. each.	Length of Sole. ins.	Width of Sole. ins.	Distance from A to Centre. ins.	Centres of Bolt Holes. ins.	Size of Bolts. ins.	Thickness of Sole at Bolt Holes. ins.	Height of Centre from Sole. ins.
1	**5**/–	$7\frac{1}{4}$	$1\frac{1}{16}$	$3\frac{1}{4}$	$5\frac{7}{8}$	$\frac{3}{8}$	$\frac{9}{16}$	2
$1\frac{1}{4}$	**5/6**	$7\frac{3}{4}$	$1\frac{3}{8}$	$3\frac{11}{16}$	$6\frac{1}{4}$	$\frac{7}{16}$	$\frac{5}{8}$	2
$1\frac{1}{2}$	**6**/–	$8\frac{13}{16}$	$1\frac{3}{4}$	$4\frac{1}{16}$	$6\frac{15}{16}$	$\frac{1}{2}$	$\frac{11}{16}$	$2\frac{1}{4}$
$1\frac{3}{4}$	**7/6**	$10\frac{1}{4}$	$2\frac{1}{16}$	$4\frac{3}{4}$	$8\frac{1}{2}$	$\frac{1}{2}$	$\frac{13}{16}$	$2\frac{3}{4}$
2	**9/6**	$11\frac{7}{8}$	$2\frac{3}{8}$	$5\frac{5}{8}$	$9\frac{5}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	3
$2\frac{1}{4}$	**12**/–	$12\frac{5}{8}$	$2\frac{11}{16}$	$5\frac{3}{4}$	$10\frac{3}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	$3\frac{1}{8}$
$2\frac{1}{2}$	**15/6**	13	3	$5\frac{7}{8}$	$10\frac{11}{16}$	$\frac{5}{8}$	1	$3\frac{7}{16}$
$2\frac{3}{4}$	**19**/–	$13\frac{5}{8}$	$3\frac{5}{16}$	$6\frac{3}{8}$	$11\frac{3}{8}$	$\frac{5}{8}$	$1\frac{1}{16}$	$3\frac{5}{8}$
3	**22/6**	$15\frac{3}{8}$	$3\frac{5}{8}$	$7\frac{3}{16}$	$12\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{16}$	$3\frac{7}{8}$

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BALL BEARINGS.

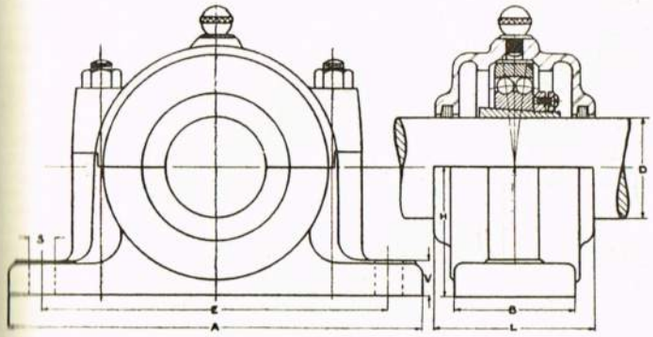
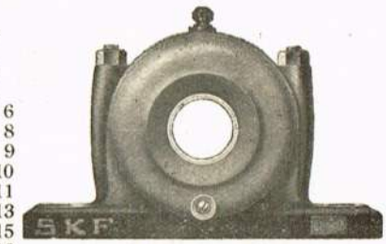


Fig. 5540.

"SKEFKO" SELF-ALIGNING BALL BEARINGS.

Standard Pattern Type F.E.

Shaft diam. Dimension D.	Bearing No.	Dimensions in inches. A. ins.	B. ins.	E. ins.	H. ins.	L. ins.	S. ins.	V. ins.	Revs. per minute 150 Max.	300 load in lbs.	500	Price complete.	Type and Code No.
1	1506E	$7\frac{1}{8}$	2	$5\frac{1}{2}$	2	3	$\frac{1}{2}$	$\frac{5}{8}$	1050	960	880	**49/9**	F.E. 6
$1\frac{1}{4}$	1508E	$8\frac{1}{4}$	$2\frac{3}{8}$	$6\frac{11}{16}$	$2\frac{3}{8}$	$3\frac{3}{8}$	$\frac{1}{2}$	$\frac{11}{16}$	1550	1400	1300	**64/3**	F.E. 8
$1\frac{1}{8}$	1509E	$8\frac{1}{4}$	$2\frac{3}{8}$	$6\frac{11}{16}$	$2\frac{3}{8}$	$3\frac{3}{8}$	$\frac{1}{2}$	$\frac{11}{16}$	1775	1550	1450	**69/9**	F.E. 9
$1\frac{1}{2}$	1510E	$8\frac{1}{4}$	$2\frac{3}{8}$	$6\frac{11}{16}$	$2\frac{3}{8}$	$3\frac{3}{8}$	$\frac{1}{2}$	$\frac{11}{16}$	1950	1750	1650	**74/3**	F.E.10
2	1511E	$10\frac{5}{8}$	$2\frac{3}{4}$	$8\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{3}{4}$	$\frac{5}{8}$	$\frac{7}{8}$	2425	2175	2025	**88/6**	F.E.11
$2\frac{1}{4}$	1513E	$11\frac{3}{8}$	$3\frac{1}{8}$	$9\frac{1}{16}$	$3\frac{1}{8}$	$4\frac{3}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	3075	2775	2575	**112/–**	F.E.13
$2\frac{1}{2}$	1515E	$11\frac{3}{8}$	$3\frac{1}{8}$	$9\frac{1}{16}$	$3\frac{1}{8}$	$4\frac{1}{2}$	$\frac{5}{8}$	$\frac{7}{8}$	3825	3450	3200	**128/6**	F.E.15
$2\frac{3}{4}$	1516E	$12\frac{5}{8}$	$3\frac{1}{2}$	$10\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{8}$	4200	3750	3525	**149/6**	F.E.16
3	1517E	$12\frac{5}{8}$	$3\frac{1}{2}$	$10\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{8}$	5050	4550	4200	**165/–**	F.E.17



Standard Type.

Fig. 5541.

"SKEFKO" SELF-ALIGNING BALL-BEARING ADJUSTABLE HANGERS.

Standard Pattern, Type S.H.

Shaft D. ins.	Drop H. ins.	A. ins.	Dimensions in inches B. ins.	E. ins.	L. ins.	Bolts required ins.	Revs. per minute. 150 Max.	300 load in lbs.	500	Price complete	Type and Code No.
1	10	$12\frac{3}{4}$	3	$10\frac{7}{8}$	$2\frac{7}{8}$	2—$\frac{5}{8}$	1050	960	880	**64/6**	S.H. 6
	12	$13\frac{1}{2}$	3	$11\frac{1}{2}$	$2\frac{7}{8}$	2—$\frac{5}{8}$				**65/–**	
	14	$14\frac{1}{4}$	$3\frac{1}{4}$	$12\frac{1}{8}$	$2\frac{7}{8}$	2—$\frac{5}{8}$				**66/6**	
$1\frac{1}{4}$	10	$15\frac{1}{4}$	$3\frac{3}{4}$	$12\frac{3}{4}$	$3\frac{1}{16}$	2—$\frac{3}{4}$	1550	1400	1300	**81/9**	S.H. 8
	12	16	$3\frac{3}{4}$	$13\frac{3}{8}$	$3\frac{1}{16}$	2—$\frac{3}{4}$				**83/6**	
	14	$16\frac{3}{4}$	4	14	$3\frac{1}{16}$	2—$\frac{3}{4}$				**85/–**	
	16	$17\frac{1}{2}$	$4\frac{1}{4}$	$14\frac{5}{8}$	$3\frac{1}{16}$	2—$\frac{3}{4}$				**87/6**	
$1\frac{1}{2}$	10	$15\frac{1}{4}$	$3\frac{3}{4}$	$12\frac{3}{4}$	$3\frac{1}{8}$	2—$\frac{3}{4}$	1775	1550	1450	**86/–**	S.H. 9
	12	16	$3\frac{3}{4}$	$13\frac{3}{8}$	$3\frac{1}{8}$	2—$\frac{3}{4}$				**87/9**	
	14	$16\frac{3}{4}$	4	14	$3\frac{1}{8}$	2—$\frac{3}{4}$				**89/3**	
	16	$17\frac{1}{2}$	$4\frac{1}{4}$	$14\frac{5}{8}$	$3\frac{1}{8}$	2—$\frac{3}{4}$				**91/9**	
$1\frac{3}{4}$	10	$15\frac{1}{4}$	$3\frac{3}{4}$	$12\frac{3}{4}$	$3\frac{1}{8}$	2—$\frac{3}{4}$	1950	1750	1650	**89/9**	S.H.10
	12	16	$3\frac{3}{4}$	$13\frac{3}{8}$	$3\frac{1}{8}$	2—$\frac{3}{4}$				**91/6**	
	14	$16\frac{3}{4}$	4	14	$3\frac{1}{8}$	2—$\frac{3}{4}$				**93/–**	
	16	$17\frac{1}{2}$	$4\frac{1}{4}$	$14\frac{5}{8}$	$3\frac{1}{8}$	2—$\frac{3}{4}$				**95/6**	
2	10	$16\frac{1}{2}$	4	$13\frac{3}{4}$	$3\frac{1}{4}$	2—$\frac{3}{4}$	2425	2175	2025	**113/–**	S.H.11
	12	$17\frac{1}{4}$	4	$14\frac{3}{8}$	$3\frac{1}{4}$	2—$\frac{3}{4}$				**115/6**	
	14	18	$4\frac{1}{4}$	15	$3\frac{1}{4}$	2—$\frac{3}{4}$				**117/9**	
	16	19	$4\frac{1}{2}$	$15\frac{7}{8}$	$3\frac{1}{4}$	2—$\frac{7}{8}$				**122/3**	
	20	$20\frac{1}{2}$	$4\frac{3}{4}$	$17\frac{1}{8}$	$3\frac{1}{4}$	2—$\frac{7}{8}$				**126/6**	
$2\frac{1}{4}$	10	$18\frac{1}{2}$	$4\frac{1}{2}$	$15\frac{1}{4}$	$4\frac{1}{4}$	2—$\frac{7}{8}$	3075	2775	2575	**131/3**	S.H.13
	12	$19\frac{1}{4}$	$4\frac{1}{2}$	16	$4\frac{1}{4}$	2—$\frac{7}{8}$				**134/9**	
	14	20	$4\frac{3}{4}$	$16\frac{3}{4}$	$4\frac{1}{4}$	2—$\frac{7}{8}$				**136/9**	
	16	$20\frac{1}{2}$	5	$17\frac{1}{2}$	$4\frac{1}{4}$	2—$\frac{7}{8}$				**140/9**	
	20	$22\frac{1}{2}$	5	$18\frac{3}{4}$	$4\frac{1}{4}$	2—$\frac{7}{8}$				**144/9**	
$2\frac{1}{2}$	10	$18\frac{1}{2}$	$4\frac{1}{2}$	$15\frac{1}{4}$	$4\frac{1}{2}$	2—$\frac{7}{8}$	3825	3450	3200	**150/–**	S.H.15
	12	$19\frac{1}{4}$	$4\frac{1}{2}$	16	$4\frac{1}{2}$	2—$\frac{7}{8}$				**153/6**	
	14	20	$4\frac{3}{4}$	$16\frac{3}{4}$	$4\frac{1}{2}$	2—$\frac{7}{8}$				**155/6**	
	16	$20\frac{1}{2}$	5	$17\frac{1}{2}$	$4\frac{1}{2}$	2—$\frac{7}{8}$				**159/6**	
	20	$22\frac{1}{2}$	5	$18\frac{3}{4}$	$4\frac{1}{2}$	2—$\frac{7}{8}$				**163/6**	
$2\frac{3}{4}$	12	$21\frac{1}{4}$	$5\frac{1}{4}$	$17\frac{3}{4}$	$4\frac{3}{4}$	2—1	4200	3750	3525	**193/6**	S.H.16
	14	22	$5\frac{1}{2}$	$18\frac{1}{2}$	$4\frac{3}{4}$	2—$1\frac{1}{8}$				**195/6**	
	16	23	$5\frac{1}{2}$	$19\frac{1}{4}$	$4\frac{3}{4}$	2—$1\frac{1}{8}$				**201/–**	
	20	$24\frac{1}{2}$	$5\frac{3}{4}$	$20\frac{3}{4}$	$4\frac{3}{4}$	2—$1\frac{1}{4}$				**208/6**	
3	12	$21\frac{1}{4}$	$5\frac{1}{4}$	$17\frac{3}{4}$	$4\frac{3}{4}$	2—1	5050	4550	4200	**207/9**	S.H.17
	14	22	$5\frac{1}{2}$	$18\frac{1}{2}$	$4\frac{3}{4}$	2—$1\frac{1}{8}$				**209/9**	
	16	23	$5\frac{1}{2}$	$19\frac{1}{4}$	$4\frac{3}{4}$	2—$1\frac{1}{8}$				**215/3**	
	20	$24\frac{1}{2}$	$5\frac{3}{4}$	$20\frac{3}{4}$	$4\frac{3}{4}$	2—$1\frac{1}{4}$				**222/9**	
	24	26	$5\frac{3}{4}$	$22\frac{1}{4}$	$4\frac{3}{4}$	2—$1\frac{1}{4}$				**230/3**	

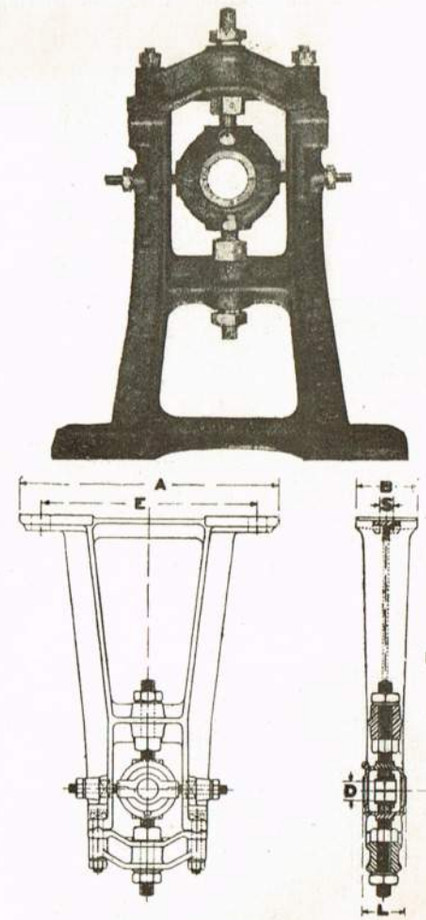


Fig. 5541.

"SKEFKO" SELF-ALIGNING BALL BEARING ADJUSTABLE HANGERS.

Standard Pattern Type S.H.

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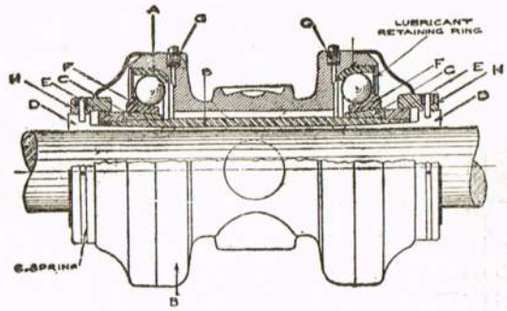
BALL BEARINGS FOR LINE SHAFTS.

A Outer race or cup

B Housing

C Cone wedge (malleable)

D Sleeve wedge (malleable)



E Lock nut

F Inner race or cone

G Grease plug

H Adjusting nut (malleable)

S Sleeve

Fig. 5550. CHAPMAN BALL BEARINGS FOR LINE SHAFTS.

Will fit all standard hangers.

Diameter of shaft, inches	1¼–1½	1¾–2	2¼–2½	2¾–3	3¼–3½	3¾–4
Price each	**60**/–	**75**/–	**105**/–	**140**/–	**245**/–	**420**/–

The load is divided equally between two races, thus ensuring ample capacity to take care of the belt pull on either side of the hanger. The special chrome nickel steel balls are guaranteed not to exceed .0001 of an inch over or under size, and are carried on a surface contact at an angle of 20 degrees from the vertical, thus enabling the bearing to take a large percentage of end thrust which no other ball bearing does. In diameter, the balls are about one-third the diameter of the line shaft corresponding to the side of the bearing. The curved raceways are made of special steel to the manufacturers' own formula, and are carbonized half way through and carefully heat treated. which gives them extreme hardness to resist fracture under heavy loads and excessive strains. The raceways are ground to true circles, 4% to 6% greater radius than the radius of the balls, and are polished to a mirror-like surface. The bearing is locked securely to the shaft by the compression of slit tapered sleeve wedges at each end, which prevents cutting or scoring of the shaft. All standard hangers can be fitted with Chapman ball bearings. Chapman hanger ball bearings are mechanically correct self-aligning bearings and require lubricating only once a year.

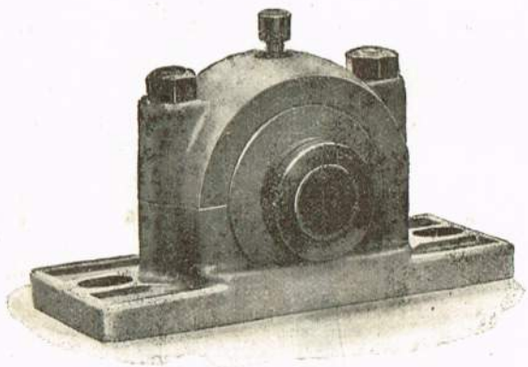


Fig. 5551.

CHAPMAN BALL BEARING PLUMMER BLOCKS

are similarly constructed to the Chapman hanger ball bearings. They are of the same high-grade material and possess the same high-class finish. This type of Plummer Block not only gives perfect ball and socket adjustment, taking care of either misalignment or sprung shafts, but the distance between the base and centre is in every size very short, thus permitting its use in places where ordinary adjustable plummer blocks could not be used. They are designed so that they can be used for either Plummer blocks, short drop hangers, or post hangers, and in any position where short centres are necessary. Their special design also permits their use in many classes of machinery and as bearings for heavy fly wheels, drums, etc.

Size, inches	1¼–1½	1¾–2	2¼–2½	2¾–3	3¼–3½	3¾–4
Length brass, inches	11	12¼	13½	16¼	20⅞	24
Base, width inches	3⅞	4⅜	4⅝	5¾	7	8
Ball centres, inches	9	10¼	11¼	13½	17¼	20
Base to centre, inches	2½	2⅞	3½	4⅛	5½	6¾
Price each	**70**/–	**105**/–	**140**/–	**210**/–	**360**/–	**575**/–

3¾″–4″. Light type for use with belts not larger than 18″ double, supplied at **420**/– each.

Dimensions same as for 3¼″–3½″.

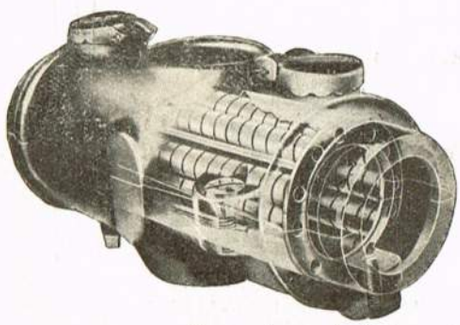


Fig. 5552.

HYATT ROLLER-BEARING UNIVERSAL SHAFTING BOX.

Diameter of shaft, inches ...	1½	1¾	2	2¼	2½	2¾
Length, inches	8¼	9¼	10½	11½	13	14
Width overall, inches	4⅝	4⅞	5¼	5½	6¼	6⅝
Height, inches	3½	3 11/16	4⅜	4⅝	5⅜	5⅝
Price each	**28**/–	**32/6**	**38**/–	**45/6**	**59**/–	**72**/–
Diameter of shaft, inches	3	3¼	3½	3¾	4	4½	5
Length, inches	15¼	16½	17¼	19½	20	22¼	24½
Width overall, inches ...	7⅛	7⅜	9⅜	10⅝	11½	12⅛	13½
Height, inches	6⅛	6⅛	7	10	10¼	12⅜	13⅝
Price each	**80**/–	**92**/–	**166**/–	**235**/–	**263**/–	**336**/–	**417**/–

See next page for Prices and Dimensions of Roller Bearing Plummer Blocks, Hangers and Brackets.

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ROLLER BEARINGS.

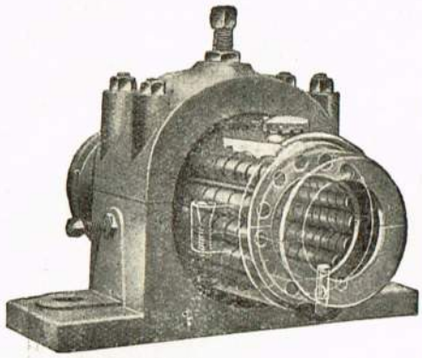

Fig. 5553.

HYATT ROLLER-BEARING BALL AND SOCKET PLUMMER BLOCKS.

Diameter of shaft, inches	1½	1¾	2	2¼	2½	2¾	3	
Length of sole, inches	10⅜	10⅜	12¼	12¼	14¼	14¼	16	
Width of sole, inches	2⅞	2⅞	3⅝	3⅝	4⅛	4⅛	4¾	
Bolt hole centres, inches	8¼	8¼	9¾	9¾	11½	11½	12¾	
Height of sole base to centre of shafting inches	2⅝	2⅝	3¼	3¼	4³/₁₆	4³/₁₆	4½	
Price each	**34/–**	**38/–**	**47/–**	**55/–**	**71/–**	**84/–**	**97/–**	
Diameter of shaft, inches	3¼	3½	3¾	4	4½	5		
Length of sole, inches	16	17¼	20	20	24½	24½		
Width of sole, inches	4¾	6	7½	7½	9	9		
Bolt hole centre, inches	12¾	14	16½	16½	19½	19½		
Height of sole base to centres of shafting, inches	4½	5⁵/₁₆	7⁵/₁₆	7½	7⅝	7⅝		
Price each	**109/–**	**195/–**	**278/6**	**306/6**	**398/6**	**479/6**		

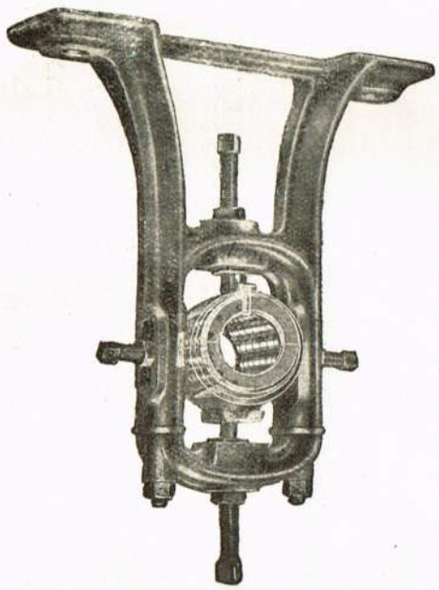

Fig. 5554.

HYATT ADJUSTABLE DROP HANGER.

Can be inverted for use as floor standards.

Hanger takes drop 1″ either side of that given. 7″ drop requires joist slotted for top screw, except 1½″ and 1¾″ sizes.

Diameter of shaft, inches	1½	1½	1½	1½	1½	1¾	1¾	1¾
Drop, inches	7	10	13	16	19	7	10	13
Centre of bolt holes, inches ...	11	12	13	14	15	11	12	13
Price complete each	**39/–**	**41/–**	**43/–**	**45/–**	**50/6**	**43/6**	**45/6**	**47/6**
Diameter of shaft, inches ...	1¾	1¾	2	2	2	2	2	2
Drop inches	16	19	7	10	13	16	19	22
Centre of bolt holes, inches ...	14	15	13	14	15	16	17	18
Price complete each	**49/6**	**55/–**	**54/–**	**56/–**	**58/–**	**61/–**	**64/–**	**67/–**
Diameter of shaft, inches ...	2	2¼	2¼	2¼	2¼	2¼	2¼	2¼
Drop, inches	25	7	10	13	16	19	22	25
Centre of bolt holes, inches ...	19	13	14	15	16	17	18	19
Price complete each	**69/–**	**61/6**	**63/6**	**65/6**	**68/6**	**71/6**	**74/6**	**76/6**
Diameter of shaft, inches ...	2½	2½	2½	2½	2½	2½	2¾	2¾
Drop, inches	10	13	16	19	22	25	10	13
Centre of bolt holes, inches ...	14¾	15¾	16¾	17¾	18¾	19¾	14¾	15¾
Price complete, each	**80/–**	**82/6**	**85/–**	**87/6**	**90/–**	**93/6**	**93/6**	**95/6**
Diameter of shaft, inches ...	2¾	2¾	2¾	2¾	3	3	3	3
Drop, inches	16	19	22	25	10	13	16	19
Centre of bolt holes, inches ...	16¾	17¾	18¾	19¾	16	17	18	19
Price complete, each	**98/–**	**100/6**	**103/–**	**106/6**	**108/–**	**111/6**	**115/6**	**118/6**
Diameter of shaft, inches ...	3	3	3¼	3¼	3¼	3¼	3¼	3¼
Drop, inches	22	25	10	13	16	19	22	25
Centre of bolt holes, inches ...	20	21	16	17	18	19	20	21
Price complete, each	**121/–**	**125/–**	**120/–**	**123/6**	**127/–**	**130/6**	**134/–**	**137/–**

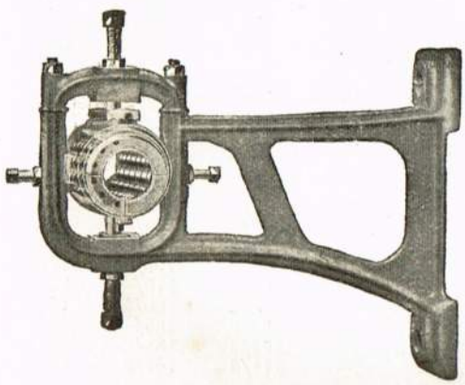

Fig. 5555.

HYATT ADJUSTABLE POST BRACKETS.

Diameter of shaft, inches ...	1½	1½	1½	1¾	1¾	1¾	2	2
From wall to centre of shafting, ins.	5	15	20	5	15	20	6	15
Centre of bolt holes, inches ...	4	4	4	4	4	4	4½	5
Price each complete	**38/6**	**44/–**	**47/–**	**43/–**	**48/6**	**57/6**	**53/–**	**58/6**
Diameter of shaft, inches ...	2	2¼	2¼	2¼	2½	2½	2½	2¾
From wall to centre of shafting, ins.	20	6	15	20	7	15	20	7
Centre of bolt holes, inches ...	5	4½	5	5	5¼	5½	5½	5¼
Price each complete	**61/–**	**60/6**	**66/–**	**68/6**	**80/–**	**83/–**	**85/6**	**93/–**
Diameter of shaft, inches ...	2¾	2¾	3	3	3	3¼	3¼	3¼
From wall to centre of shafting, ins.	15	20	8	15	20	8	15	20
Centre of bolt holes, inches ...	5½	5½	6	6	6	6	6	6
Price each complete	**96/–**	**98/6**	**107/6**	**113/6**	**118/6**	**119/6**	**125/6**	**130/6**

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HANGERS.

ADJUSTABLE BEARING.

Fig. 5560. Open-sided Hanger.

Diam. of shaft. inches	Maximum drop to centre of shaft. A	PRICE EACH Ordinary oiling With cast iron bearing	Self-oiling. With gun-metal bottom lining	With gun metal top and bottom lining
1¼	8	12/6	17/6	19/6
	10	13/–	18/–	20/–
	13	14/–	19/–	21/–
	16	15/–	20/–	22/–
	19	16/–	21/–	23/–
	22	17/6	22/6	24/6
	25	19/–	24/–	26/–
1½	8	13/–	18/–	20/6
	10	13/6	18/6	21/–
	13	14/6	19/6	22/–
	16	15/6	20/6	23/–
	19	16/6	21/6	24/–
	22	18/–	23/–	25/6
	25	19/6	24/6	27/–
1¾	10	16/–	23/–	26/6
	13	17/6	24/6	28/–
	16	19/–	26/–	29/6
	19	20/6	27/6	31/–
	22	22/6	29/6	33/–
	25	25/–	32/–	35/6
2	10	18/–	25/6	29/6
	13	19/6	27/–	31/–
	16	21/–	28/6	32/6
	19	22/6	30/–	34/–
	22	24/6	32/–	36/–
	25	26/6	34/–	38/–
2¼	10	21/–	30/–	35/6
	13	22/6	31/6	37/–
	16	24/–	33/–	38/6
	19	26/–	35/–	40/6
	22	28/–	37/–	42/6
	25	30/–	39/–	44/6
	27	33/–	42/–	47/6
	30	36/–	45/–	50/6
2½	10	23/–	33/6	41/–
	13	24/6	35/–	42/6
	16	26/–	36/6	44/–
	19	28/–	38/6	46/–
	22	30/–	40/6	48/–
	25	32/–	42/6	50/–
	27	35/–	45/6	53/–
	30	38/–	48/6	56/–
2¾	13	32/–	44/6	54/–
	16	33/6	46/–	55/6
	19	35/6	48/–	57/6
	22	37/6	50/–	59/6
	25	40/–	52/6	62/–
	27	42/6	55/–	64/6
	30	45/6	58/–	67/6
	36	49/–	61/6	71/–
3	13	34/6	47/–	56/–
	16	36/–	48/6	57/6
	19	38/–	50/6	59/6
	22	40/6	53/–	62/–
	25	43/–	55/6	64/6
	27	46/–	58/6	67/6
	30	49/–	61/6	70/6
	36	53/–	65/6	74/6
3¼	16	46/6	67/6	80/–
	19	49/6	70/6	83/–
	22	54/–	75/–	87/6
	25	57/6	78/6	91/–
	27	61/6	82/6	95/–
	30	66/6	87/6	100/–
	36	72/6	93/6	106/–
3½	16	47/6	72/6	85/–
	19	50/6	75/6	88/–
	22	55/–	80/–	92/6
	25	58/6	83/6	96/–
	27	62/6	87/6	100/–
	30	67/6	92/6	105/–
	36	73/6	98/6	111/–
4	16	68/–	98/–	113/–
	19	72/–	102/–	117/–
	22	78/–	108/–	123/–
	25	83/–	113/–	128/–
	27	88/–	118/–	133/–
	30	95/–	125/–	140/–
	36	103/–	133/–	148/–

Fig. 5560.
Open-sided Hanger,
with swivel bearings, adjustable vertically.

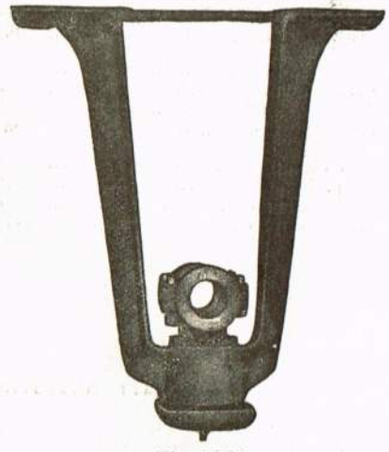

Fig. 5561.
Double-sided Hanger.

Fig. 5561. Double-sided Hanger.

Diam. of shaft. inches	Maximum drop to centre of shaft. A	PRICE EACH Ordinary oiling With cast iron bearing	Self-oiling. With gun-metal bottom lining	With gun-metal top and bottom lining
1¼	8	13/–	18/–	20/–
	10	14/–	19/–	21/–
	13	15/–	20/–	22/–
	16	16/–	21/–	23/–
	19	17/6	22/6	24/6
	22	19/–	24/–	26/–
	25	21/–	26/–	28/–
1½	8	13/6	18/6	21/–
	10	14/6	19/6	22/–
	13	15/6	20/6	23/–
	16	16/6	21/6	24/–
	19	18/–	23/–	25/6
	22	19/6	24/6	27/–
	25	21/6	26/6	29/–
1¾	10	18/6	25/6	29/–
	13	20/–	27/–	30/6
	16	21/–	28/–	31/6
	19	22/6	29/6	33/–
	22	25/–	32/–	35/6
	25	28/–	35/–	38/6
2	10	20/6	28/–	32/–
	13	22/–	29/6	33/6
	16	23/–	30/6	34/6
	19	25/–	32/6	36/6
	22	27/–	34/6	38/6
	25	30/–	37/6	41/6
2¼	10	23/–	32/–	37/6
	13	24/6	33/6	39/–
	16	26/6	35/6	41/–
	19	28/6	37/6	43/–
	22	31/–	40/–	45/6
	25	33/–	42/–	47/6
	27	36/–	45/–	50/6
	30	40/–	49/–	54/6
2½	10	25/–	35/6	43/–
	13	26/6	36/6	44/–
	16	28/6	38/6	46/–
	19	30/6	40/6	48/–
	22	33/–	43/–	50/6
	25	35/–	45/–	52/6
	27	38/–	48/–	55/6
	30	42/–	52/–	59/6
2¾	13	34/6	47/–	56/6
	16	36/–	48/6	58/–
	19	38/6	51/–	60/6
	22	40/6	53/–	62/6
	25	43/6	56/–	65/6
	27	46/6	59/–	68/6
	30	50/6	63/–	72/6
	36	55/–	67/6	77/–
3	13	37/–	49/6	58/6
	16	38/6	51/–	60/–
	19	41/–	53/6	62/6
	22	43/6	56/–	65/–
	25	46/6	59/–	68/–
	27	50/–	62/6	71/6
	30	54/–	66/6	75/6
	36	59/–	71/6	80/6
3¼	16	51/–	72/–	84/6
	19	54/–	75/–	87/6
	22	59/–	80/–	92/6
	25	63/–	84/–	96/6
	27	67/–	88/–	100/6
	30	72/–	93/–	105/6
	36	79/–	100/–	112/6
3½	16	52/–	77/–	89/6
	19	55/–	80/–	92/6
	22	60/–	85/–	97/6
	25	64/–	89/–	101/6
	27	68/–	93/–	105/6
	30	73/–	98/–	110/6
	36	80/–	105/–	117/6
4	16	74/–	104/–	119/–
	19	78/6	108/6	123/6
	22	85/–	115/–	130/–
	25	90/6	120/6	135/6
	27	95/6	125/–	140/–
	30	103/6	133/–	148/–
	36	111/6	141/6	156/6

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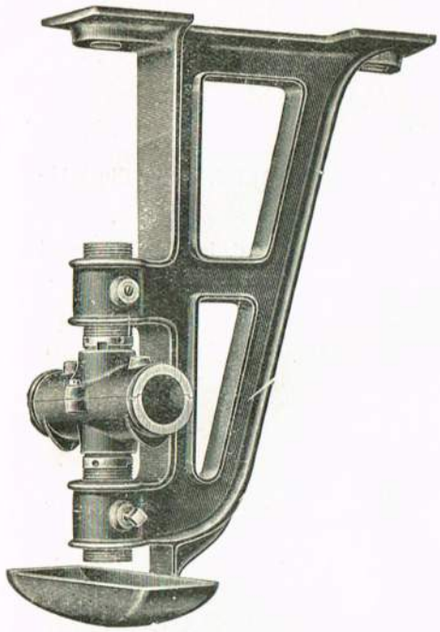

HANGERS.

Fig. 5562. OPEN-SIDE HANGERS.

With Adjustable Swivel Bearings.

This series of Open-side Hangers with Adjustable Swivel Bearings is most useful in the erection of small lines of Shafting or Countershafts.

They are (with the exception of self-oilers) fitted with Oil Trays, Stauffer's or Needle Lubricators can be fitted on either side of the bearing or a central lubricator can be fitted in the top of the adjusting screw (except in the very short drops).

N.B.—A vertical line passing through the centre of Shaft also passes through the centre of the Front Bolt, except in the 2½in., 2¾in. and 3in. Hangers of 10in. drop, which have the front bolt set back 3¼in. from centre of shaft.

Length of Cast-iron Bearings equal to four diameters.

Size of Bore ins.	Distance from Beam to Centre ins.	Price Cast-iron Bearings each	Price, with Gun-metal Bearings each	Price, with White-metal Bearings each	Price, with Cast-iron Self-oiling Bearings each	Price, with Self-oiling Bearings G.M. lined each	Mark	Length of Base ins.	Width of Base ins.	Centres of Bolt Holes ins.
1	7	7/–	8/6	11/6	...	—	—	10¼	3¼	8¼
1	10	7/6	9/–	12/–	—	—	—	11½	3⅜	9
1	13	8/–	9/6	12/6	—	—	—	12½	3⅜	10½
1¼	7	8/6	11/–	13/6	13/6	14/6	—	11	3½	8¾
1¼	10	10/–	12/6	15/–	15/–	16/–	—	11¾	3½	9⅜
1¼	13	12/–	14/6	17/–	17/–	18/–	—	12½	3½	10½
1½	7	10/–	13/–	15/6	15/–	16/–	—	12¾	3½	9¼
1½	10	11/–	14/–	16/6	16/–	17/–	—	13½	3½	10¼
1½	13	12/6	15/6	18/–	17/6	18/6	—	14½	3¾	10⅞
1½	16	14/–	16/6	19/6	19/–	20/–	—	14¾	4	11½
1¾	10	14/–	17/6	21/–	20/–	21/6	—	14½	3¾	11¼
1¾	13	14/6	18/–	21/6	20/6	22/–	—	15½	3¾	12¼
1¾	16	15/–	18/6	23/–	21/–	23/6	—	16½	4½	12¾
1¾	19	16/3	19/9	23/3	22/3	23/9	—	17½	5	13½
1¾	21	17/6	21/–	24/6	23/6	25/–	—	18¾	5¼	14¾
1¾	22	19/3	22/–	26/3	25/3	26/9	—	19½	5½	15½
1¾	25	21/–	24/6	28/–	27/–	28/6	—	20	6½	16
2	10	15/6	20/–	23/6	22/6	24/6	—	15¾	3¾	13¼
2	13	16/–	20/6	24/–	23/–	25/–	—	16½	4	12¾
2	16	17/6	22/–	25/6	24/6	26/6	—	17½	4½	13⅜
2	19	18/–	22/6	26/–	25/–	27/–	—	18	5	14
2	21	18/6	23/–	26/6	25/6	27/6	—	18¾	5¼	14¾
2	22	19/–	24/9	27/–	26/–	28/–	—	19	5½	15
2	25	22/–	26/6	30/–	29/–	31/–	—	20	6¼	16
2¼	10	18/–	24/–	28/–	26/–	29/–	S 279	16½	3¾	12¼
2¼	13	19/–	25/–	29/–	27/–	30/–	S 280	17½	4	13¼
2¼	16	20/–	26/–	30/–	28/–	31/–	S 281	18	4¾	14
2¼	19	20/6	26/6	30/6	28/6	31/6	S 1511	19	5¼	15
2¼	21	21/–	27/–	31/–	29/–	32/–	S 344	19½	5⅜	15½
2¼	22	23/–	29/–	33/–	31/–	34/–	S 1512	20	5½	16
2¼	25	25/–	31/–	35/–	33/–	36/–	S 345	20½	6½	16½
2½	10	22/–	29/6	33/–	31/–	35/–	S 1137	16½	4	13½
2½	13	23/–	30/6	34/–	32/–	36/–	S 282	19	4½	16
2½	16	24/–	31/6	35/–	33/–	37/–	S 283	19½	4¾	15¾
2½	18	24/6	32/–	35/6	33/6	37/6	S 1464	21	5⅛	16½
2½	19	24/9	32/3	35/9	33/9	37/9	S 1607	21	5½	16½
2½	21	25/–	32/6	36/–	34/–	38/–	S 284	21½	5⅛	16¾
2½	22	26/9	34/3	37/9	35/9	39/9	S 1608	21½	6	16¾
2½	25	28/6	36/–	39/6	37/6	41/6	S 346	22¾	6½	18
2½	28	32/–	39/6	43/–	41/–	45/–	S 1609	23	7	18½
2½	31	40/–	47/–	51/–	49/–	53/–	S 348	25½	7½	20⅞
2¾	10	27/–	37/–	39/6	38/–	42/6	S 1610	15½	4½	11½
2¾	13	28/–	38/–	40/6	39/–	43/6	S 285	20	4½	15½
2¾	16	28/6	38/6	41/–	39/6	44/–	S 286	20¾	4¾	16½
2¾	18	29/–	39/3	41/6	40/–	44/6	S 1463	22½	5½	17½
2¾	19	29/–	39/3	41/6	40/–	44/6	S 1611	21½	5½	16¾
2¾	21	30/–	40/–	42/6	41/–	45/6	S 287	23	5½	18¾
2¾	22	30/6	40/6	43/–	41/6	46/–	S 1612	23	6	18¾
2¾	25	31/–	41/–	43/6	42/–	46/6	S 347	23½	6½	18⅝
2¾	28	34/6	44/6	47/–	45/6	50/–	S 1613	24½	7	20
2¾	31	42/6	52/6	55/–	53/6	58/–	S 348	25½	7½	20⅞
3	10	30/–	42/6	46/–	42/–	49/–	S 1139	16½	4½	12½
3	13	31/3	43/6	47/3	43/3	50/3	S 1140	20	4½	16
3	16	32/6	44/6	48/6	44/6	51/6	S 288	21½	4⅞	16⅞
3	18	33/8	45/3	49/9	45/9	52/9	S 1463	22½	5½	17½
3	19	34/–	46/3	50/–	46/–	53/–	S 1513	22½	5½	17¾
3	21	35/–	47/–	51/–	47/–	54/–	S 289	22¾	5½	18
3	22	36/–	48/–	52/–	48/–	55/–	S 1514	23	6	18½
3	25	40/–	52/–	56/–	52/–	59/–	S 290	23¾	6½	19
3	28	42/6	54/6	58/6	54/6	61/6	S 1515	24	7	19½
3	31	45/–	57/–	61/–	57/–	64/–	S 348	25½	7½	20⅞
3¼	16	53/–	70/–	68/6	69/–	79/6	S 1434	26	6	20
3¼	21	58/–	75/–	73/6	74/–	84/6	S 1435	28	7	22
3¼	25	63/–	80/–	78/6	79/–	89/6	S 1436	30	8	24
3¼	31	67/–	84/–	82/6	83/–	93/6	S 1437	32	9	26
3½	16	55/–	75/6	72/–	72/–	84/–	S 1434	26	6	20
3½	21	60/–	80/6	77/–	77/–	89/–	S 1435	28	7	22
3½	25	65/–	85/6	82/–	82/–	94/–	S 1436	20	8	34
3½	31	69/–	89/6	86/–	86/–	98/–	S 1437	32	9	26

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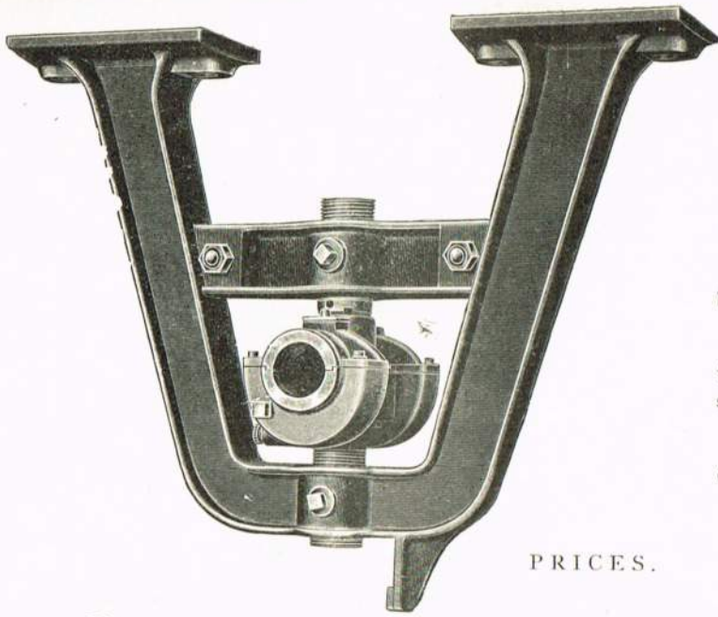

HANGERS.

Fig. 5563. SLING HANGERS, with Adjustable Swivel Bearings.

These Hangers are strongly designed with broad bases, and are specially suited for main lines of Shafting.

The Centre Bar is removable to allow of threading the Shafting, and the Bearings are adjustable vertically, so that levelling can be accomplished easily and quickly.

They are (with the exception of self-oilers) fitted with Oil Trays.

PRICES.

Size of Bore. ins.	Distance from Beam to Centre. ins.	Cast Iron Bearings. each.	Gun-metal Bearings. each.	White Metal Bearings. each.	Cast Iron Self-oiling Bearings. each.	Self-oiling Bearings, G.M. lined. each.	Length of Base. ins.	Width of Base. ins.	Centre of Bolt Holes. Inside. ins.	Centre of Bolt Holes. Outside. ins.
2	10	18/–	22/6	26/–	25/–	27/–	23⅜	5¾	10½	22⅜
2	13	20/–	24/6	28/–	27/–	29/–	27	5¾	12⅛	44½
2	16	22/–	26/6	30/–	29/–	31/–	28¾	5¾	13⅝	26¼
2	19	24/–	28/6	32/–	31/–	33/–	30⅝	5¾	15¼	28⅛
2	21	24/6	29/–	32/6	31/6	33/6	31¾	5¾	16½	29⅛
2	22	24/6	29/–	32/6	31/6	33/6	32½	5¾	16⅞	29¾
2	25	26/–	30/6	34/–	33/–	35/–	24⅛	5¾	18⅜	31⅝
2¼	10	19/6	24/9	29/6	27/6	30/6	25⅜	5¾	10½	22⅞
2¼	13	20/6	26/6	30/6	28/6	31/6	27	5¾	12⅛	24½
2¼	16	23/6	29/6	33/6	31/6	34/6	28¾	5¾	13⅝	26¼
2¼	19	24/–	30/–	34/–	32/–	35/–	30⅝	5¾	15¼	28⅛
2¼	21	24/6	30/6	34/6	32/6	35/6	31¾	5¾	16½	29⅛
2¼	22	25/–	31/–	35/–	33/–	36/–	32½	5¾	16⅞	29¾
2¼	25	27/–	32/3	37/–	35/–	38/–	34⅛	5¾	18⅜	31⅝
2½	9	26/–	33/6	37/–	35/–	39/–	28	6	13	25
2½	10	27/–	34/6	38/–	36/–	40/–	28½	6	12	25½
2½	13	28/–	35/6	39/–	37/–	41/–	30¼	6	13½	27¾
2½	16	30/–	37/6	41/–	39/–	43/–	32½	6	15⅜	29⅞
2½	19	31/3	38/9	42/3	40/3	44/3	34	6	17	31
2½	22	32/6	40/–	43/6	41/6	45/6	36	6	18⅜	32⅞
2½	25	36/–	43/6	47/–	45/–	49/–	37½	6	20	34⅝
2½	28	39/–	46/6	50/–	48/–	52/–	39½	6	21¾	36½
2½	31	42/–	49/6	53/–	51/–	55/–	41	6¾	23⅛	38¼
2¾	9	28/–	38/–	40/6	39/–	43/6	28	6	13	25
2¾	10	29/–	39/–	41/6	40/–	44/6	28½	6	12	25½
2¾	13	30/–	40/–	42/6	41/–	45/6	30¼	6	13½	27¾
2¾	16	32/–	42/–	44/6	43/–	47/6	32½	6	15⅜	29⅜
2¾	19	32/6	42/6	45/–	43/6	48/–	34	6	17	31
2¾	22	33/–	43/–	45/6	44/–	48/6	36	6	18⅜	32⅞
2¾	25	38/–	48/–	50/6	49/–	53/6	37½	6	20	34⅝
2¾	28	41/6	51/6	54/–	52/6	57/–	39½	6	21¾	36½
2¾	31	45/–	55/–	57/6	56/–	60/6	41	6¾	23⅛	38¼
3	10	32/6	44/6	48/6	44/6	51/6	28½	6	12	25½
3	13	35/–	47/–	51/–	47/–	54/–	30¼	6¾	13½	27⅞
3	16	40/–	52/–	56/–	52/–	59/–	32½	6¾	15⅜	29⅜
3	19	41/–	53/–	57/–	53/–	60/–	34	6¾	17	31
3	22	42/–	54/–	58/–	54/–	61/–	36	6¾	18⅜	22⅞
3	25	45/–	57/–	61/–	57/–	64/–	37½	6¾	20	34⅝
3	28	46/3	58/3	62/3	58/3	65/3	39½	6¾	21¾	36½
3	31	47/6	59/6	63/6	59/6	66/6	41	6¾	23⅛	38¼
3¼	16	58/–	75/–	73/6	74/–	84/6	34¾	8	13	31¼
3¼	19	60/–	77/–	75/6	76/–	86/6	36½	8	14¾	33
3¼	25	68/–	85/–	83/6	84/–	94/6	40	8	17¾	36½
3¼	31	74/–	91/–	89/6	90/–	106/–	43½	8	21	40
3½	16	60/–	80/6	77/–	77/–	89/–	34¾	8	13	31¼
3½	19	62/–	82/6	79/–	79/–	91/–	36½	8	14¾	33
3½	25	70/–	90/6	87/–	87/–	99/–	40	8	17¾	36½
3½	31	76/–	96/6	93/–	93/–	105/–	43½	8	21	40
4	19	78/–	103/–	98/–	102/–	118/6	40	9	15¼	36
4	25	84/–	109/–	104/–	108/–	124/6	43½	9	18½	39½
4	31	90/–	115/–	110/–	114/–	130/6	47	9	21¾	43
4	37	96/–	121/–	116/–	120/–	136/6	50½	9	24¾	46½

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WALL BRACKETS

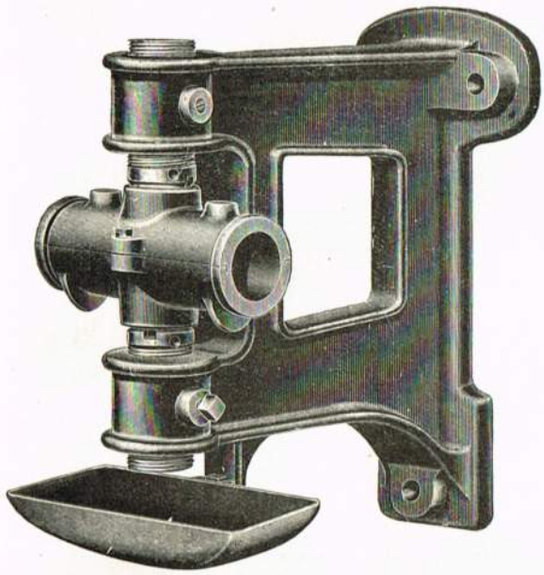

Fig. 5564. WALL BRACKETS, with Adjustable Swivel Bearings.

These Brackets are well designed and of proportionate strength to carry the Shafting at the distances named.

They are (with the exception of self-oilers) fitted with Oil Trays.

Special Double Wall Plates for the Two Top Bolts of these Brackets.

For all Brackets	1 in. to	$1\frac{1}{2}$ in.	$\frac{5}{8}$ in. thick at Bolt Holes...			**1/–** each
,, ,,	$1\frac{3}{4}$ in. to	$2\frac{1}{4}$ in.	$\frac{7}{8}$ in.	,,	,, ...	**2/–** ,,
,, ,,	$2\frac{1}{2}$ in. to	3 in.	1 in.	,,	,, ...	**3/–** ,,
,, ,,	$3\frac{1}{4}$ in. to	$3\frac{1}{2}$ in.	$1\frac{1}{8}$ in.	,,	,, ...	**4/–** ,,
,, ,,		4 in.	$1\frac{3}{8}$ in.	,,	,, ...	**6/–** ,,

Length of Cast-iron Bearings equal to four diameters.

Size of Bore ins.	Distance from Wall to Centre ins.	Price Cast-iron Bearings each	Price with Gun-Metal Bearings each	Price, with White-metal Bearings each	Price, with Cast-iron Self-oiling Bearings each	Price with Self-oiling Bearings G.M. lined each	Length of Base ins.	Width of Base Top and Bottom ins.	Centres of Bolt Holes ins.	Distance from Top of Base to Centre Line ins.	Distance from Top of Base to Bolt Centre ins.	Size of Holding up Bolts ins.	Thickness of Base at Bolt Holes ins.
1	7	**10/6**	**12/–**	**15/–**	—	—	$12\frac{5}{8}$	6 & 4	10 ×4	$5\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
1	10	**11/6**	**13/–**	**16/–**	—	—	$13\frac{1}{2}$	6 ,, 4	$10\frac{1}{2}\times4$	$5\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
1	13	**12/6**	**14/–**	**17/–**	—	—	$13\frac{5}{8}$	6 ,, 4	11 ×4	$6\frac{1}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
$1\frac{1}{4}$	7	**11/–**	**13/6**	**16/–**	**16/–**	**17/–**	$12\frac{5}{8}$	6 & 4	10 ×4	$5\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
$1\frac{1}{4}$	10	**12/–**	**14/6**	**17/–**	**17/–**	**18/–**	$13\frac{1}{2}$	6 ,, 4	$10\frac{1}{2}\times4$	$5\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
$1\frac{1}{4}$	13	**13/–**	**15/6**	**18/–**	**18/–**	**19/–**	$13\frac{5}{8}$	6 ,, 4	11 ×4	$6\frac{1}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
$1\frac{1}{2}$	7	**12/–**	**15/–**	**17/6**	**17/–**	**18/–**	$12\frac{5}{8}$	6 ,, 4	10 ×4	$5\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
$1\frac{1}{2}$	10	**13/–**	**16/–**	**18/6**	**18/–**	**19/–**	$13\frac{1}{2}$	6 ,, 4	$10\frac{1}{2}\times4$	$5\frac{13}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
$1\frac{1}{2}$	13	**14/–**	**17/–**	**19/6**	**19/–**	**20/–**	$13\frac{5}{8}$	6 ,, 4	11 ×4	$6\frac{1}{16}$	$1\frac{5}{8}$	$\frac{1}{2}$	1
$1\frac{3}{4}$	7	**12/6**	**16/–**	**19/6**	**18/6**	**20/–**	16	8 & $4\frac{1}{2}$	$12\frac{1}{2}\times5$	$7\frac{7}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
$1\frac{3}{4}$	10	**13/6**	**17/–**	**20/6**	**19/6**	**21/–**	$16\frac{5}{8}$	8 ,, $4\frac{1}{2}$	13 ×5	$7\frac{7}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
$1\frac{3}{4}$	13	**14/6**	**18/–**	**21/6**	**20/6**	**22/–**	$17\frac{5}{8}$	8 ,, $4\frac{1}{2}$	14 ×5	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
$1\frac{3}{4}$	16	**15/6**	**19/–**	**22/6**	**21/6**	**23/–**	$18\frac{5}{8}$	8 ,, $4\frac{1}{2}$	15 ×5	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
$1\frac{3}{4}$	20	**16/6**	**20/–**	**23/6**	**22/6**	**24/–**	20	8 ,, $4\frac{1}{2}$	$16\frac{1}{2}\times5$	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
2	7	**16/–**	**20/6**	**24/–**	**23/–**	**25/–**	16	8 & $4\frac{1}{2}$	$12\frac{1}{2}\times5$	$7\frac{7}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
2	10	**17/–**	**21/6**	**25/–**	**24/–**	**26/–**	$16\frac{5}{8}$	8 ,, $4\frac{1}{2}$	13 ×5	$7\frac{7}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
2	13	**20/–**	**24/6**	**28/–**	**27/–**	**29/–**	$17\frac{5}{8}$	8 ,, $4\frac{1}{2}$	14 ×5	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
2	16	**22/6**	**27/–**	**30/6**	**29/6**	**31/6**	$18\frac{5}{8}$	8 ,, $4\frac{1}{2}$	15 ×5	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
2	20	**25/–**	**29/6**	**33/–**	**32/–**	**34/–**	20	8 ,, $4\frac{1}{2}$	$16\frac{1}{2}\times5$	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{5}{8}$	$1\frac{3}{8}$
$2\frac{1}{4}$	7	**18/–**	**24/–**	**28/–**	**26/–**	**29/–**	16	8 & $4\frac{1}{2}$	$12\frac{1}{2}\times5$	$7\frac{7}{16}$	$2\frac{5}{16}$	$\frac{3}{4}$	$1\frac{3}{8}$
$2\frac{1}{4}$	10	**20/–**	**26/–**	**30/–**	**28/–**	**31/–**	$16\frac{5}{8}$	8 ,, $4\frac{1}{2}$	13 ×5	$7\frac{7}{16}$	$2\frac{5}{16}$	$\frac{3}{4}$	$1\frac{3}{8}$
$2\frac{1}{4}$	13	**22/–**	**28/–**	**32/–**	**30/–**	**33/–**	$17\frac{5}{8}$	8 ,, $4\frac{1}{2}$	14 ×5	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{3}{4}$	$1\frac{3}{8}$
$2\frac{1}{4}$	16	**24/–**	**30/–**	**34/–**	**32/–**	**35/–**	$18\frac{5}{8}$	8 ,, $4\frac{1}{2}$	15 ×5	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{3}{4}$	$1\frac{3}{8}$
$2\frac{1}{4}$	20	**28/–**	**34/–**	**38/–**	**36/–**	**39/–**	20	8 ,, $4\frac{1}{2}$	$16\frac{1}{2}\times5$	$7\frac{11}{16}$	$2\frac{5}{16}$	$\frac{3}{4}$	$1\frac{3}{8}$
$2\frac{1}{2}$	10	**21/–**	**28/6**	**32/–**	**30/–**	**34/–**	$18\frac{7}{8}$	9 & 5	15 ×6	$8\frac{5}{8}$	$2\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$
$2\frac{1}{2}$	13	**23/–**	**30/6**	**34/–**	**32/–**	**36/–**	$19\frac{7}{8}$	9 ,, 5	16 ×6	$8\frac{3}{4}$	$2\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$
$2\frac{1}{2}$	16	**25/–**	**32/6**	**36/–**	**34/–**	**38/–**	$20\frac{7}{8}$	9 ,, 5	17 ×6	$8\frac{7}{8}$	$2\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$
$2\frac{1}{2}$	20	**29/–**	**36/6**	**40/–**	**38/–**	**42/–**	$22\frac{3}{8}$	9 ,, 5	$18\frac{1}{2}\times6$	9	$2\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$
$2\frac{1}{2}$	25	**36/–**	**43/6**	**47/–**	**45/–**	**49/–**	$22\frac{3}{4}$	9 ,, 5	$18\frac{5}{8}\times6$	$9\frac{1}{4}$	$2\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{8}$
$2\frac{3}{4}$	13	**30/–**	**40/–**	**42/6**	**41/–**	**45/6**	$21\frac{5}{8}$	9 & 6	17 ×6	$8\frac{1}{2}$	3	$\frac{7}{8}$	$1\frac{5}{8}$
$2\frac{3}{4}$	16	**33/–**	**43/–**	**45/6**	**44/–**	**48/6**	$22\frac{3}{8}$	9 ,, 6	18 ×6	$9\frac{1}{2}$	$2\frac{5}{8}$	$\frac{7}{8}$	$1\frac{5}{8}$
$2\frac{3}{4}$	20	**36/–**	**46/–**	**48/6**	**47/–**	**51/6**	$24\frac{3}{8}$	9 ,, 6	20 ×6	$9\frac{1}{2}$	$2\frac{5}{8}$	$\frac{7}{8}$	$1\frac{5}{8}$
$2\frac{3}{4}$	25	**40/–**	**50/–**	**52/6**	**51/–**	**55/6**	$26\frac{3}{8}$	9 ,, 6	22 ×6	$9\frac{3}{8}$	$2\frac{5}{8}$	$\frac{7}{8}$	$1\frac{5}{8}$
3	13	**32/–**	**44/–**	**48/–**	**44/–**	**51/–**	$21\frac{3}{8}$	9 & 6	17 ×6	$8\frac{1}{2}$	3	$\frac{7}{8}$	$1\frac{5}{8}$
3	16	**35/–**	**47/–**	**51/–**	**47/–**	**54/–**	$22\frac{3}{8}$	9 ,, 6	18 ×6	$9\frac{1}{2}$	$2\frac{5}{8}$	$\frac{7}{8}$	$1\frac{5}{8}$
3	20	**38/–**	**50/–**	**54/–**	**50/–**	**57/–**	$24\frac{3}{8}$	9 ,, 6	20 ×6	$9\frac{1}{2}$	$2\frac{5}{8}$	$\frac{7}{8}$	$1\frac{5}{8}$
3	25	**42/–**	**54/–**	**58/–**	**54/–**	**61/–**	$26\frac{3}{8}$	9 ,, 6	22 ×6	$9\frac{3}{8}$	$2\frac{5}{8}$	$\frac{7}{8}$	$1\frac{5}{8}$
$3\frac{1}{4}$	13	**46/–**	**63/–**	**61/6**	**62/–**	**72/6**	29	12 & 7	24 ×7	$10\frac{1}{2}$	3	1	2
$3\frac{1}{4}$	16	**48/–**	**65/–**	**63/6**	**64/–**	**74/6**	$29\frac{1}{2}$	12 ,, 7	$24\frac{1}{2}\times7$	$10\frac{3}{4}$	3	1	2
$3\frac{1}{4}$	20	**51/–**	**68/–**	**66/6**	**67/–**	**77/6**	$30\frac{1}{4}$	12 ,, 7	$25\frac{1}{4}\times7$	11	3	1	2
$3\frac{1}{4}$	25	**54/–**	**71/–**	**69/6**	**70/–**	**80/6**	$31\frac{1}{8}$	12 ,, 7	$26\frac{1}{8}\times7$	$11\frac{3}{8}$	3	1	2
$3\frac{1}{2}$	13	**48/–**	**68/6**	**65/–**	**65/–**	**77/–**	29	12 & 7	24 ×7	$10\frac{1}{2}$	3	1	2
$3\frac{1}{2}$	16	**50/–**	**70/6**	**67/–**	**67/–**	**79/–**	$29\frac{1}{2}$	12 ,, 7	$24\frac{1}{2}\times7$	$10\frac{3}{4}$	3	1	2
$3\frac{1}{2}$	20	**53/–**	**73/6**	**70/–**	**70/–**	**82/–**	$30\frac{1}{4}$	12 ,, 7	$25\frac{1}{4}\times7$	11	3	1	2
$3\frac{1}{2}$	25	**56/–**	**76/6**	**73/–**	**73/–**	**85/–**	$31\frac{1}{8}$	12 ,, 7	$26\frac{1}{8}\times7$	$11\frac{3}{8}$	3	1	2
4	16	**66/–**	**91/–**	**86/–**	**90/–**	**106/6**	$33\frac{3}{4}$	15 & 8	$26\frac{3}{4}\times8$	$12\frac{5}{8}$	4	$1\frac{1}{4}$	$2\frac{1}{4}$
4	20	**69/–**	**94/–**	**89/–**	**93/–**	**109/6**	$34\frac{3}{4}$	15 ,, 8	$27\frac{3}{4}\times8$	$12\frac{3}{4}$	4	$1\frac{1}{4}$	$2\frac{1}{4}$
4	25	**73/–**	**98/–**	**93/–**	**97/–**	**113/–**	$35\frac{1}{8}$	15 ,, 8	$28\frac{1}{8}\times8$	$13\frac{1}{8}$	4	$1\frac{1}{4}$	$2\frac{1}{4}$
4	31	**80/–**	**105/–**	**100/–**	**104/–**	**120/6**	$35\frac{7}{8}$	15 ,, 8	$28\frac{7}{8}\times8$	$13\frac{3}{4}$	4	$1\frac{1}{4}$	$2\frac{1}{4}$

All our Adjustable Fittings have Chased Screws of fine pitch, and are therefore capable of much finer adjustment than those made with Cast Screws.

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ADJUSTABLE BEARINGS.

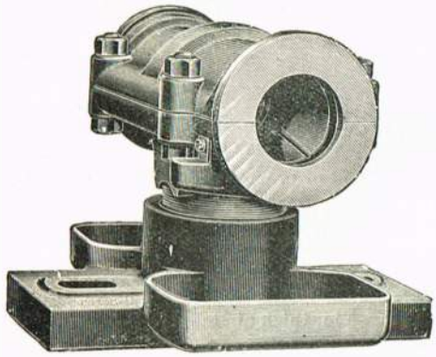


Fig. 5565. Swivel Bearings, adjustable vertically. Self-oiling and Ordinary Oiling Series.

Bore in inches	Price each. Cast-iron bearings. Ordinary oiling	Self-oiling With gun-metal bottom lining	Self-oiling With gun-metal top and bottom lining	Length of bearing. Ordinary and self-oiling pattern	Dimensions in inches. Sole Length	Sole Width	Holding down bolts. Centres	Thickness through bolt holes.	Minimum height to centre.
1¼	**9/6**	**14/6**	**16/6**	5	8	2⅞	5⅜	1	4
1½	**10/–**	**15/–**	**17/6**	6	8	2⅞	5⅜	1	4
1¾	**11/–**	**18/–**	**21/6**	7	10	3⅛	7⅛	1⅛	5¼
2	**12/6**	**20/–**	**24/–**	8	10	3⅛	7⅛	1⅛	5¼
2¼	**15/–**	**24/–**	**29/6**	9	12	4½	8½	1¼	6½
2½	**17/–**	**27/6**	**35/–**	10	12	4½	8½	1¼	6½
2¾	**22/6**	**35/–**	**44/6**	11	14	5	10½	1⅜	7¾
3	**25/–**	**37/6**	**46/6**	12	14	5	10½	1⅜	7¾
3¼	**34/–**	**55/–**	**67/6**	13	15½	5½	11½	1⅝	8½
3½	**35/–**	**60/–**	**72/6**	14	15½	5½	11½	1⅝	8½
4	**50/–**	**80/–**	**95/–**	16	17½	6½	13½	1¾	9½
4½	**75/–**	**110/–**	**140/–**	18	19	8	14×4½	2	9¾
5	**100/–**	**145/–**	**180/–**	20	22	9	17×4¾	2¼	11½

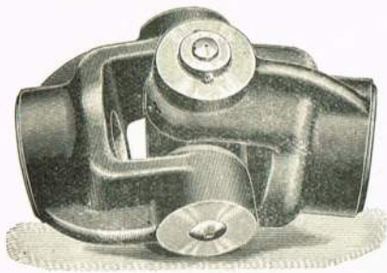
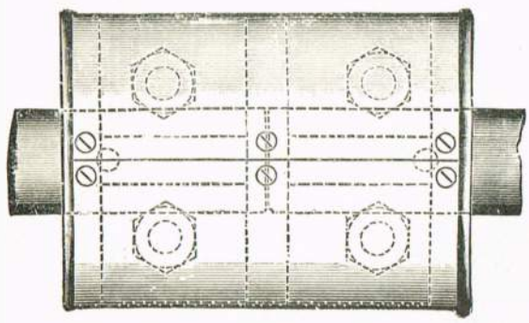


Fig. 5566. Universal Joint Couplings.

These Couplings are for connecting shafts where the centres intersect each other at any angle up to a maximum of 20 degrees.

All wearing surfaces are accurately machined, and the small centre pins are securely held in place by Steel Collars pinned on.

Size of bore, inches	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4
Length overall ,, ...	4½	5½	6¼	7½	9¼	10¼	11½	12¾	15	15	17½	17½	20
Diam. ,, ,, ...	3⅞	4⅜	5⅛	6¼	7⅛	8¼	9	10	11⅞	11⅞	14	14	15¾
Price complete set	**15/–**	**18/–**	**20/–**	**22/–**	**30/–**	**36/–**	**46/–**	**54/–**	**76/–**	**76/–**	**100/–**	**100/–**	**130/–**



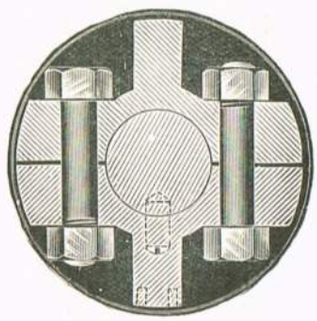


Fig. 5567. The "Grippa" Split Muff Couplings.

Size of Bore. ins.	**PRICE.** each.	Diameter. ins.	Length. ins.
1	**6/–**	4⅛	5
1¼	**6/6**	4⅛	5
1½	**8/6**	5⅛	6
1¾	**11/–**	5⅜	7
2	**14/–**	5⅝	8
2¼	**17/–**	6⅝	9
2½	**20/–**	6⅞	10
2¾	**24/–**	7¾	11
3	**28/–**	8⅛	12
3¼	**35/–**	8⅞	13
3½	**42/–**	9¼	14
4	**50/–**	10¾	16

The special feature in these Split Muff Couplings is the steel pin projecting into the shaft, which, when the coupling is bolted up, renders slipping impossible, but care should be taken that the hole is deep enough so that the pin does not touch the bottom; or for light drives the pin can be discarded and the coupling simply gripped on the shaft.

No special spanner is required for tightening the bolts, and all projecting parts are covered with a neat steel cover.

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WALL BRACKETS, HANGERS, Etc.

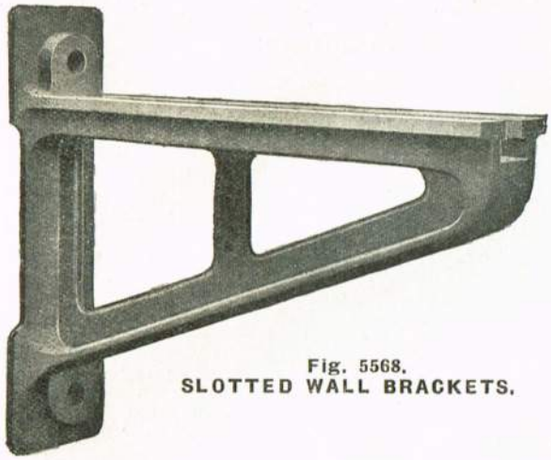

Fig. 5568.
SLOTTED WALL BRACKETS.

Distance from wall to centre of shaft, inches	10	14	18	12	18
Will take Plummer blocks, inches ...	1¼ & 1½	1¼ & 1½	1¼ & 1½	1¾ & 2	1¾ & 2
Length of arm, inches ...	14½	18½	22½	17½	23½
Length of base, inches ...	13¼	15	16½	16	18½
Width of base, inches ...	3½	3½	4	4¾	4¾
Bolt centres	11	12¾	14¼	13½	16
Price	**9/–**	**10/–**	**13/–**	**17/–**	**20/–**

Distance from wall to centre of shaft, inches	24	12	18	24	16	22	26
Will take Plummer blocks, inches ...	1¾ & 2	2¼	2¼	2¼	2½	2½	2½
Length of arm, inches ...	29½	18	24	30	22½	28½	32½
Length of base, inches ...	21½	17	19½	22½	19½	22	25
Width of base, inches ...	5	5	5	5½	5	5	6
Bolt centres, inches... ...	18½	14	16½	19	16½	19	21
Price	**26/–**	**20/–**	**24/–**	**30/–**	**24/–**	**30/–**	**34/–**

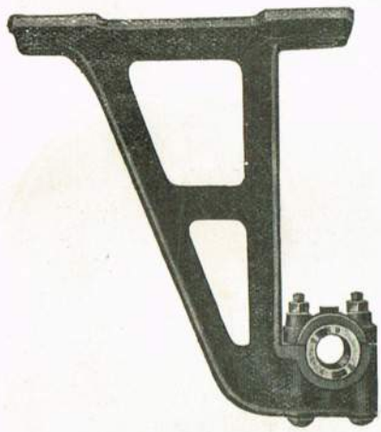

Fig. 5569. J Hangers.

Fig. 5569. J HANGERS.

Fitted with top and bottom gun-metal bearings, equal in length to 1½ diameters.

Distance from beam to centres inches	Bore, in inches 1	1¼	1½	1¾	2
8	**6/9**	**8/–**	**9/6**	—	—
10	**7/–**	**8/3**	**10/–**	**12/–**	**17/3**
12	**7/6**	**8/6**	**10/3**	**12/6**	**17/9**
14	—	**9/3**	**10/6**	**13/3**	**18/6**
16	—	—	**12/–**	**14/6**	**19/9**
18	—	—	**13/3**	—	**21/–**
20	—	—	—	—	**22/6**

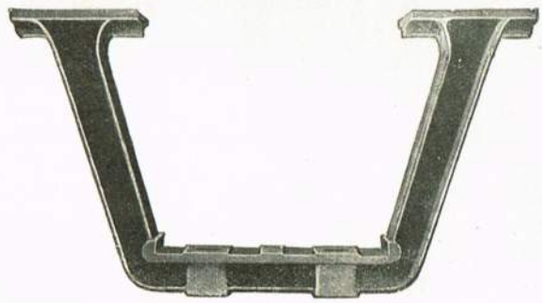

Fig. 5570. SLING HANGERS.

Distance from beam to centre of shaft, inches	9	13	16	9	13	16
For Plummer blocks up to, inches ...	2	2	2	2½	2½	2½
Length of base, inches	29	31¼	33	32⅞	35¼	37
Width of base, inches	4¾	4¾	4¾	5¾	5¾	5¾
Inside bolt centres	16	18¼	19⅞	17⅞	20⅛	21⅝
Outside bolt centres, inches	27	29¼	30⅞	30⅜	32⅞	34½
Diameter of holding-up bolts, inches ...	½	½	½	⅝	⅝	⅝
Price	**14/–**	**16/–**	**19/–**	**25/–**	**27/–**	**29/–**

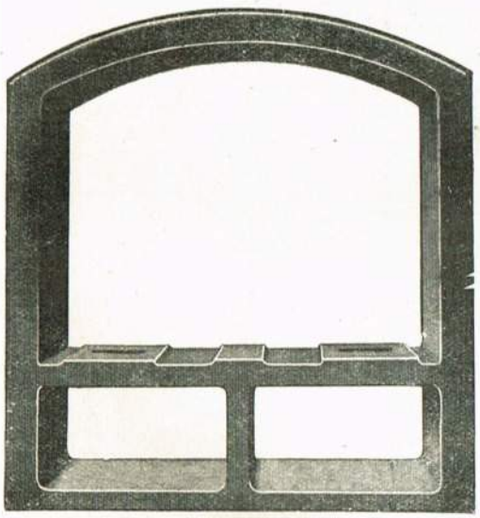

Fig. 5571. WALL BOXES.

For 4½″ wall, will take any plummer block up to 1½″	...	**11/–**
,, 4½″ ,, ,, ,, ,, 2″	...	**12/–**
,, 4½″ ,, ,, ,, ,, 3″	...	**20/–**
,, 9″ ,, ,, ,, ,, 1½″	...	**16/–**
,, 9″ ,, ,, ,, ,, 2¼″	...	**24/–**
,, 9″ ,, ,, ,, ,, 2¾″	...	**32/–**
,, 9″ ,, ,, ,, ,, 3½″	...	**45/–**
,, 9″ ,, ,, ,, ,, 4″	...	**55/–**

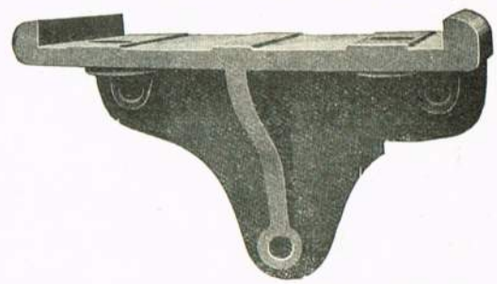

Fig. 5572.
END WALL BRACKETS fitted with Slotted Bolt Holes.

Will take plummer block up to 1¼″	...	**6/–**
,, ,, ,, 1½″	...	**8/–**
,, ,, ,, 1¾″	...	**10/–**
,, ,, ,, 2¼″	...	**12/–**
,, ,, ,, 2½″	...	**16/–**
,, ,, ,, 2¾″	...	**20/–**

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COUPLINGS, ETC.

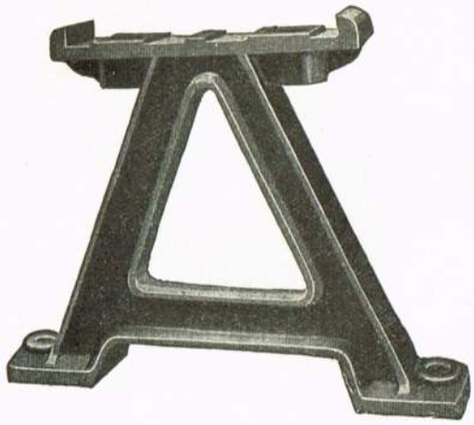

Fig. 5573. "A" STANDARD.

With slotted bolt holes and planed to receive bolt holes.

Will take Plummer block up to inches	1½	1½	1½	1½	1½	1½	2	2	2
Height from base to centre, inches	11	14	16	19	22	25	11	14	16
Length of base, inches ...	14½	16⅝	19	21⅝	24½	27	15½	19	20¾
Width of base, inches ...	3¼	3⅜	3½	3¾	4	4	4	4	4½
Bolt centres, inches ...	12½	14⅝	17	19⅝	22½	25⅛	13⅛	17	18½
Price	**8/–**	**9/–**	**10/–**	**11/–**	**13/–**	**15/–**	**14/–**	**15/–**	**16/–**

Will take Plummer block up to inches	2	2	2	2½	2½	2½	2½	2½
Height from base to centre, inches	19	22	25	14	16	19	22	25
Length of base, inches	22½	26¼	28⅛	18⅞	21	22⅜	26½	28¾
Width of base, inches	4⅝	5	5	5	5	5	5½	5½
Bolt centres, inches	20¼	24	25⅞	16⅜	18½	20⅛	24	26¼
Price	**17/–**	**19/–**	**21/–**	**26/–**	**27/–**	**28/–**	**30/–**	**32/–**

Fig. 5575. Ordinary Flanged Type.

Flanged and Safety Pulley Couplings.

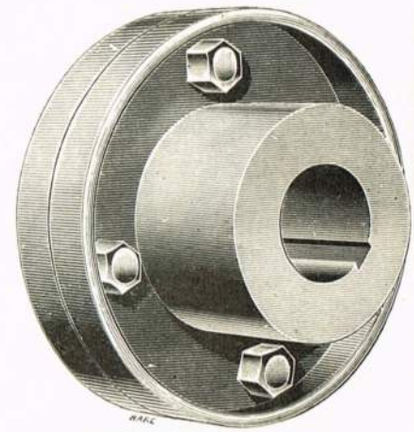

Fig. 5576. Safety Pulley Type.

No projecting bolts.

	Diameter of bore, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3
Ordinary.	Price each ...	**6/–**	**6/6**	**7/6**	**9/6**	**12/–**	**14/–**	**18/–**	**21/–**	**25/–**
Safety.	,, ,, ...	**8/6**	**9/6**	**10/–**	**13/–**	**16/–**	**20/–**	**23/–**	**27/6**	**32/–**

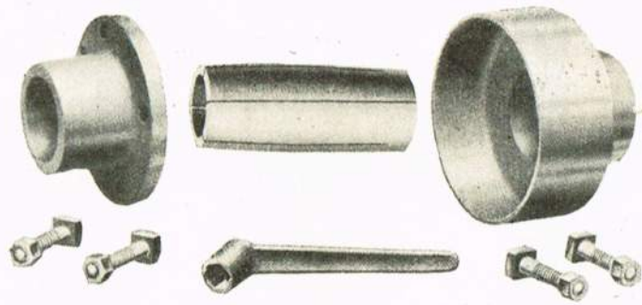

Fig. 5577. COMPRESSION COUPLING.

No keys. Machined all over.

Diameter of shafting, inches	1¼	1½	1¾	2	2¼	2½	2¾	3
Length over all, inches	4¼	5	6	6¾	7½	8¼	9	10
Outside diameter, inches	5¼	5⅝	6¼	7	7½	8⅜	9	10
Price each	**10/9**	**11/10**	**15/3**	**18/–**	**20/9**	**24/9**	**31/3**	**39/6**

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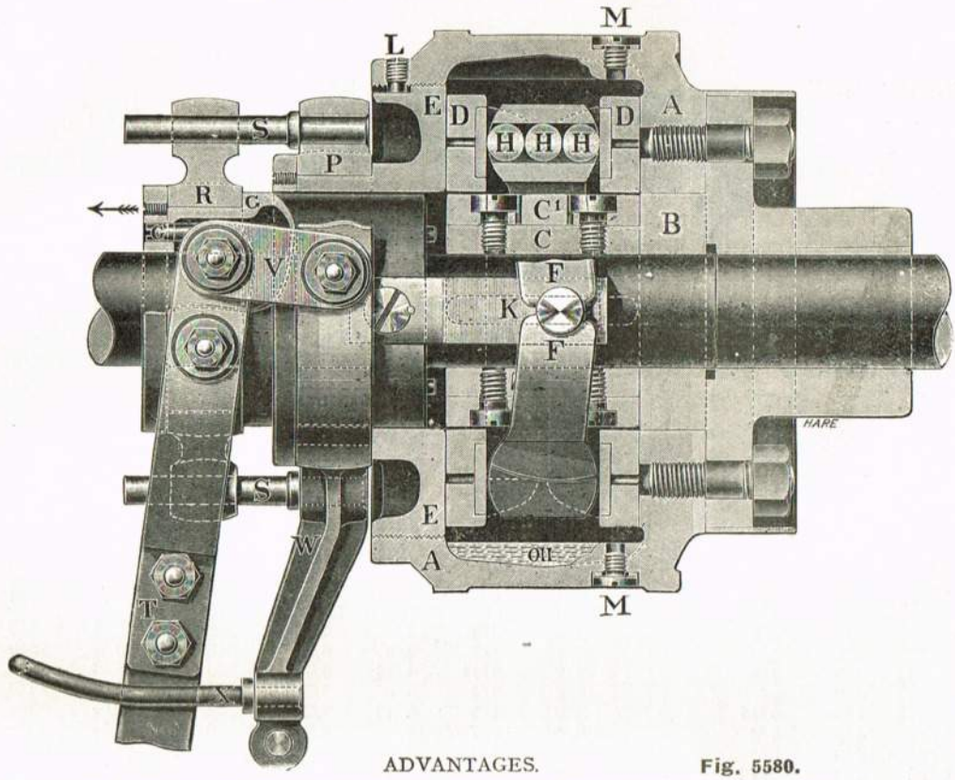
FRICTION CLUTCH.



ADVANTAGES. **Fig. 5580.**

Positive action.—This clutch is smooth and positive in action ; centrifugal force has no detrimental effect upon it.

Materials and workmanship.—All materials and workmanship are of the highest class. The toggle rollers and roller plates are of the finest steel, ground to within $^1/_{2000}''$.

No projections.—There are no projections, all working parts being enclosed within the case, and it takes up but little room on the shaft.

Dust-proof.—It is practically dust-proof, both in and out of action.

Easily erected.—The parts are few and simple, easily erected and adjusted.

No end thrust.—It puts no end thrust on the bearings when in or out of gear.

Friction surfaces.—The friction surfaces are of cast iron, working in oil, and after long and severe duty none of the parts shew appreciable wear.

Pulley.—The pulley is not a part of the clutch, but is keyed on the clutch sleeve.

THE "EXHIBITION" FRICTION CLUTCH.

PRICE LIST OF CLUTCH COUPILNGS AND PULLEY CLUTCHES.

Mark of clutch	No. 0			...	No. 1			...	No. 2			...	No. 3			
Max. B.H.P. at 100 r.p.m. ...	1¼			...	3			...	5			...	7½			
Max. bore, inches	1½			...	2			...	2½			...	2¾			
Price each, as clutch coupling...	**65/–**			...	**90/–**			...	**110/–**			...	**135/–**			
Price each, as pulley clutch ...	**70/–**			...	**95/–**			...	**115/–**			...	**140/–**			
Extra for patent striking gear...	**26/–**			...	**28/–**			...	**30/–**			...	**30/–**			
Bore, inches	1	1¼	1½	...	1½	1¾	2	...	1¾	2	2¼	2½	...	2	2¼	2½	2¾
Price for G.M. bushes for clutch couplings	**2/–**	**2/6**	**3/–**	...	**3/–**	**4/–**	**5/–**	...	**5/–**	**5/–**	**5/6**	**6/–**	...	**5/–**	**5/6**	**6/–**	**6/6**
Price of G.M. bushes for pulley clutches	**5/–**	**6/6**	**8/–**	...	**9/–**	**10/6**	**12/3**	...	**10/6**	**12/3**	**17/–**	**19/6**	...	**15/–**	**17/–**	**19/6**	**21/6**
Mark of clutch	No. 4			...	No. 5			...	No. 6			...	No. 7			
Max. B.H.P. at 100 r.p.m. ...	12			...	15			...	20			...	35			
Max. bore, inches	3¼			...	3¾			...	4½			...	4½			
Price, each, as clutch coupling	**175/–**			...	**190/–**			...	**235/–**			...	**285/–**			
Price, each, as pulley clutch ...	**182/–**			...	**197/–**			...	**245/–**			...	**295/–**			
Extra for patent striking gear	**32/–**			...	**34/–**			...	**38/–**			...	**42/–**			
Bore, inches	2½	2¾	3	3¼	...	3	3¼	3½	3¾	...	3¼	3½	4	4½	...	3¼	3½	4	4½
Price of G.M. bushes for clutch couplings	**6/–**	**6/6**	**7/6**	**8/–**	...	**7/6**	**8/–**	**8/6**	**9/6**	...	**8/–**	**8/6**	**10/–**	**12/–**	...	**8/–**	**8/6**	**10/–**	**12/–**
Price of G.M. bushes for pulley clutches	**23/–**	**25/6**	**28/–**	**30/6**	...	**32/6**	**35/6**	**38/–**	**40/6**	...	**40/–**	**43/6**	**50/–**	**58/–**	...	**45/–**	**48/6**	**56/–**	**62/–**
Mark of clutch	...	...	...		No. 8.				...		No. 9-				...		No. 10		
Max. B.H.P. at 100 r.p.m.	...	...	...		50				...		75				...		100		
Max. bore, inches	...	...	...		5				...		5½				...		6		
Price rach, as clutch coupling	...	...	...		**400/–**				...		**500/–**				...		**600/–**		
Price each, as pulley clutch	...	...	...		**425/–**				...		**540/–**				...		**645/–**		
Extra for patent striking gear	...	...	...		Special				...		Special				...		Special		
Bore, inches	...	...	...	3½	4	4½	5		...	4	4½	5	5½		...	4½	5	5½	6
Price of G.M. bushes for clutch couplings			...	**9/–**	**10/6**	**12/6**	**14/–**		...	**17/–**	**18/6**	**20/–**	**22/–**		...	**20/–**	**23/–**	**25/–**	**27/–**
Price of G.M. bushes for pulley clutches ...			...	**50/–**	**60/–**	**70/–**	**80/–**		...	**64/–**	**75/–**	**85/–**	**90/–**		...	**82/–**	**92/–**	**100/–**	**115/–**

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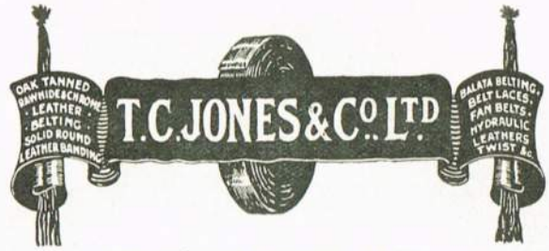
BELTING, LEATHER.

Fig. 5590.

OAK TANNED LEATHER BELT

Cut from selected English Ox Strap Butts. Joints are cemented only or cemented and sewn with laces or copper wire.



Every care is taken to provide only the **best** quality belting. Cheaper qualities can be provided to compete with lower grades on the market, but only when expressly desired.

STANDARD PRICE LIST.

SINGLE LEATHER.

Width inches	4 m/m per ft.	5 m/m per ft.	6 m/m per ft.	7 m/m per ft.
½	5½d.	—	—	—
⅝	6d.	—	—	—
¾	6½d.	—	—	—
⅞	7d.	—	—	—
1	7½d.	9½d.	—	—
1¼	9½d.	1/–	—	—
1½	11½d.	1/2	—	—
1¾	1/1½	1/4½	—	—
2	1/3	1/7	2/–	2/5
2¼	1/5	1/9½	2/3	2/9
2½	1/7	1/11½	2/6	3/–
2¾	1/9	2/2	2/9	3/4
3	1/10½	2/4	3/–	3/8
3¼	—	2/7	3/3	4/–
3½	—	2/10	3/6	4/4
3¾	—	3/–	3/9	4/7
4	—	3/2	4/–	4/11
4¼	—	3/5	4/3	5/4
4½	—	3/7	4/6	5/6
4¾	—	3/10	4/9	5/10

SINGLE LEATHER.

Width inches	4 m/m per ft.	5 m/m per ft.	6 m/m per ft.	7 m/m per ft.
5	—	4/–	5/–	6/2
5½	—	4/6	5/7	6/10
6	—	4/10	6/2	7/6
6½	—	5/3	6/8	8/2
7	—	5/8	7/2	8/9
8	—	6/7	8/4	10/2
9	—	7/5	9/4	11/5
10	—	8/4	10/6	12/10
11	—	9/2	11/7	14/2
12	—	10/–	12/8	15/5

DOUBLE LEATHER.

Width inches	8 m/m per ft.	10 m/m per ft.	12 m/m per ft.	14/ m/m per ft.
2	2/6	3/2	4/–	4/10
2¼	2/10	3/7	4/6	5/5
2½	3/2	3/11	4/11	6/–
2¾	3/6	4/4	5/5	6/7
3	3/9	4/9	5/11	7/3
3½	4/6	5/7	7/–	8/7
4	5/1	6/5	8/–	9/10
4½	5/9	7/2	9/1	11/–

DOUBLE LEATHER.

Width inches	8 m/m per ft.	10 m/m per ft.	12 m/m per ft.	14 m/m per ft.
5	6/5	7/11	10/1	12/3
5½	7/2	8/11	11/3	13/9
6	7/9	9/8	12/3	15/–
7	9/1	11/4	14/3	17/3
8	10/6	13/2	16/7	20/3
9	11/10	14/9	18/7	22/9
10	13/4	16/8	21/–	25/8
11	14/8	18/4	23/2	28/3
12	16/–	20/–	25/5	30/10
13	17/4	21/8	27/4	33/5
14	18/8	23/4	29/5	35/11
15	20/–	25/–	31/6	38/6
16	21/4	26/8	33/8	41/1
18	24/–	30/–	37/10	46/3
20	26/8	33/4	42/–	51/4
22	29/4	36/8	46/3	56/6
24	32/–	40/–	50/5	61/7
30	40/–	50/–	63/–	77/–
36	48/–	60/–	75/8	92/5
40	53/4	66/8	84/–	102/8

Fig. 5591. STANDARD PRICE LIST OF PATENT TANNED CHROME BELTING.

This belt is specially recommended for damp situations, such as laundries.

SINGLE LEATHER CHROME.

Width, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼	4½	4¾	5
Price per foot	6¾d.	9d.	11¼d.	1/1½	1/3¾	1/6	1/8¼	1/10½	2/1½	2/4½	2/7½	2/10½	3/1½	3/4½	3/7½	3/10½	4/1½

Width, inches	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	13	14
Price per foot	4/7½	5/1½	5/6¾	6/–	6/5¼	6/10½	7/3¾	7/9	8/2¼	8/7½	9/1	9/6	9/11	10/4½	11/3	12/1½

Plus **10½d.** per inch over 14 ins. wide.

DOUBLE LEATHER CHROME.

Width, inches	2	2½	3	3¼	3½	3¾	4	4¼	4½	4¾	5	5½	6	6½	7	7½	8
Price per foot	2/7½	3/4½	4/1½	4/6½	4/11	5/4½	5/9	6/2	6/7	7/–	7/4½	8/2	9/–	10/–	11/–	11/10½	12/9

Width, inches	8½	9	10	11	12	13	14	15	16	17	18	19	20	21	22	24
Price per foot	13/7½	14/6	16/3	18/–	20/3	22/–	23/9	25/6	27/3	29/–	30/9	32/6	34/3	36/–	37/9	41/3

Plus **1/9** per inch over 24 inches wide.

Fig. 5592. STANDARD PRICE LIST OF RAW-HIDE BELTING.

Specially suitable for high-speed work. Extremely strong and supple.

SINGLE LEATHER RAW HIDE.

Width, inches	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼	4½	4¾	5
Price per foot	9d.	1/–	1/3	1/6	1/9	2/–	2/3	2/6	2/10	3/2	3/6	3/10	4/2	4/6	4/10	5/2	5/6

Width, inches	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	13	14
Price per foot	6/2	6/10	7/5	8/–	8/7	9/2	9/9	10/4	10/11	11/6	12/1	12/8	13/3	13/10	15/–	16/2

Plus **1/2** per inch over 14 inches wide.

Width, inches	2	2½	3	3¼	3½	3¾	4	4¼	4½	4¾	5	5½	6	6½	7	7½	8
Price per foot	3/6	4/6	5/6	6/–	6/7	7/1½	7/8	8/2½	8/9	9/3½	9/10	10/11	12/–	13/4	14/8	15/10	17/–

Width, in inches	8½	9	10	11	12	13	14	15	16	17	18	19	20	21	22	24
Price per foot	18/2	19/4	21/8	24/–	27/–	29/4	31/8	34/–	36/4	38/8	41/–	43/4	45/8	48/–	50/4	55/6

Plus **2/4** per foot over 24 inches.

Combinations of Leather and Balata sewn can be supplied to any specification at the shortest notice.

Fig. 5593. PRICE LIST OF SOLID ROUND LEATHER BELTING.

Diameter, inches	⅛	3/16	7/32	¼	9/32	5/16	11/32	⅜	7/16	½
Price per 100 ft.	11/–	13/–	15/–	17/–	23/–	28/–	37/6	45/6	80/–	90/–

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BELTING.

Fig. 5596.

BEST BALATA BELTING.

Made from Pure Cotton and Balata

STANDARD PRICE LIST.

Price List per Foot.

Width in inches	3-ply	4-ply	5-ply	6-ply	7-ply	8-ply	9-ply	10-ply
1	6d.	8d.	10d.	1/–	—	—	—	—
1¼	7½d.	10d.	1/0½	1/3	—	—	—	—
1½	9d.	1/–	1/3	1/6	—	—	—	—
1¾	10½d.	1/2	1/5½	1/9	—	—	—	—
2	1/–	1/4	1/8	2/–	—	—	—	—
2¼	1/1½	1/6	1/10½	2/3	—	—	—	—
2½	1/3	1/8	2/1	2/6	—	—	—	—
2¾	1/4½	1/10	2/3½	2/9	—	—	—	—
3	1/6	2/–	2/6	3/–	—	—	—	—
3¼	1/7½	2/2	2/8½	3/3	—	—	—	—
3½	1/9	2/4	2/11	3/6	—	—	—	—
3¾	1/10½	2/6	3/1½	3/9	—	—	—	—
4	2/0½	2/8½	3/4	4/0½	4/9½	5/5	6/0½	6/8
4½	2/2	2/11	3/6½	4/4	5/7½	5/10	6/5½	7/1
4½	2/4½	3/1	3/9	4/7	5/10½	6/2	6/10	7/6
4¾	2/6	3/3½	3/11½	4/11½	6/2	6/7	7/3	7/11
5	2/7½	3/5	4/3½	5/2	6/5	6/10	7/8½	8/7
5½	2/11½	3/10½	4/9	5/8½	7/–	7/9	8/7½	9/6
6	3/2	4/3	5/4	6/3	7/6½	8/6	9/7	10/8
6½	3/4½	4/8½	5/10½	6/9½	8/2	9/5	10/7	11/9
7	3/6½	4/11½	6/5	7/8½	8/10	9/11	11/4½	12/10
7½	3/10½	5/6	7/–	8/7½	9/7½	11/–	12/6	14/–
8	4/3	6/1	7/6½	9/6½	10/8	12/2	13/7½	15/1
9	5/0½	6/9½	8/1	10/5½	12/1½	13/7	14/10½	16/2

Price List per Foot.

Width in inches	3-ply	4-ply	5-ply	6-ply	7-ply	8-ply	9-ply	10-ply
10	5/8½	7/7½	8/10	11/4½	13/8	15/3	16/5½	17/8
11	6/5	8/3	9/6½	12/6	15/1½	16/6	17/9½	19/1
12	7/2	9/1	10/3½	13/7	16/8½	18/2	19/4½	20/7
13	7/8½	9/9	11/–	14/8	17/9½	19/6	20/9	22/–
14	8/1	10/5½	11/11	15/11½	18/11	20/11	22/4½	23/10
15	8/7½	11/2½	12/10	17/3	20/2	22/5	24/0½	25/8
16	9/2	11/11	13/9	18/6½	21/5½	23/10	25/8	27/6
17	9/10	12/8	14/8	19/10	22/11	25/4	27/4	29/4
18	10/4½	13/5	15/7	21/1	24/2½	26/10	29/–	31/2
19	10/9	14/1½	16/6	22/4½	25/4	28/3	30/7½	33/–
20	11/5½	15/3	17/5	23/8	27/2	30/6	32/8	34/10
21	12/2½	15/11½	18/4	24/11½	28/9½	31/11	34/3½	36/8
22	12/11½	16/8½	19/5½	26/5	30/3	33/5	36/2	38/11
23	13/8	17/5	20/4½	28/1	31/9	34/10	37/9½	40/9
24	14/4	18/2	21/5½	29/8½	33/7	36/4	39/7½	42/11
26	15/5	19/6	22/8	30/9	35/7	39/–	42/2	45/4
28	16/2	20/11	23/10	31/11	37/10	41/10	44/9	47/8
30	17/3	22/5	25/8	34/6	40/4	44/10	48/1	51/4
32	18/4	23/10	27/6	37/1	42/11	47/8	51/4	55/–
34	19/8	25/4	29/4	39/8	45/10	50/8	54/8	58/8
36	20/9	26/10	31/2	42/2	48/5	53/8	58/–	62/4
38	21/6	28/3	33/–	44/9	50/8	56/6	61/3	66/–
40	22/11	30/6	34/10	47/4	54/4	61/–	65/4	69/8

Endless Belts charged 3 ft. extra.

Fig. 5597. **STANDARD PRICE LIST IMPROVED WOVEN HAIR BELTING**

Suitable for damp situations or gritty work.

Width, inches	....	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼	4½	4¾	5	5½	6	6½	7	7½
Price per foot	....	1/3	1/5½	1/8	1/10½	2/1	2/3½	2/6	2/8½	2/11	3/1½	3/4	3/6½	3/9	3/11½	4/2	4/7	5/–	5/6	6/–	6/8
Width, inches	....	8	8½	9	9½	10	11	12	13	14	15	16	18	20	22	24	26	30	32	36	42
Price per foot	....	7/4	8/–	8/8	9/4	10/–	11/4	12/8	14/–	15/4	16/8	18/–	20/8	23/4	26/8	30/–	33/4	40/–	44/–	52/–	64/–

Fig. 5598. **STANDARD PRICE LIST OF SEWN COTTON DUCK BELTING.**

Made in Red or Black. Red supplied unless specified.

4-Ply Width ins.	Price per ft.	6-Ply Width ins.	Price per ft.	8-Ply Width ins.	Price per ft.	10-Ply. Width ins.	Price per ft.
1½	9d.	3	2/3	6	6/–	6	7/6
1¾	10½d.	3½	2/7½	7	7/–	9	11/3
2	1/–	4	3/–	8	8/–	12	15/–
2¼	1/1½	4½	3/4½	9	9/–	15	18/9
2½	1/3	5	3/9	10	10/–	20	25/–
2¾	1/4½	6	4/6	11	11/–	24	30/–
3	1/6	7	5/3	12	12/–	30	37/6
3½	1/9	8	6/–	15	15/–	36	45/–
4	2/–	9	6/9	18	18/–	42	52/6
5	2/6	10	7/6	24	24/–	48	60/–
6	3/–	12	9/–	30	30/–	—	—

Prices can be calculated as follows:

4-ply	6d.	per inch width of foot
6-ply	9d.	,, ,,
8-ply	1/–	,, ,,
10-ply	1/3	,, ,,

Intermediate widths and plies in proportion.

Endless Belts in Balata and Cotton are charged 3 feet extra.

Fig. 5599. **CHROME OR HELVETIA BELT LACES.**

	Sewing.									Lashing.							
Length .... feet	2	2½	3	3½	4	4½	5	6	....	2	2½	3	3½	4	4½	5	6
Price per gross	15/–	21/–	27/–	42/–	54/–	72/–	96/–	120/–	....	18/–	36/–	48/–	60/–	72/–	90/–	120/–	150/–

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BELTING.

STANDARD PRICE LIST.

Fig. 5600.

SOLID WOVEN COTTON BELTING.

Made in Natural White Finish or Black Waterproof Finish.

Please specify when ordering.

Width Inches	Single. Thickness. Inch	Price per ft. s.	d.	Extra Stout. Thickness. Inch	Price per ft. s.	d.	Triple. Thickness. Inch.	Price per ft. s.	d.
up to 2	3/16	1	0	1/4	1	4	9/32	1	8
2¼	3/16	1	2	1/4	1	5	9/32	1	10
2½	3/16	1	4	1/4	1	7	9/32	2	0
2¾	3/16	1	6	1/4	1	9	9/32	2	2
3	3/16	1	8	1/4	2	0	5/16	2	5
3¼	3/16	1	10	1/4	2	3	5/16	2	8
3½	7/32	2	0	1/4	2	6	5/16	3	0
4	7/32	2	3	9/32	2	9	5/16	3	4
4½	7/32	2	6	9/32	3	1	11/32	3	9
5	7/32	2	9	9/32	3	5	11/32	4	2
5½	7/32	3	0	9/32	3	10	11/32	4	7
6	1/4	3	4	9/32	4	2	11/32	5	0
7	1/4	3	9	9/32	4	8	3/8	5	7
8	1/4	4	2	9/32	5	2	3/8	6	2
9	1/4	4	8	5/16	5	9	3/8	6	10
10	1/4	5	2	5/16	6	4	3/8	7	6
11	1/4	5	8	5/16	7	0	13/32	8	2
12	9/32	6	2	5/16	7	8	13/32	9	2
13	9/32	6	9	5/16	8	5	13/32	10	4
14	9/32	7	4	11/32	9	2	13/32	11	6
15	9/32	8	0	11/32	10	0	13/32	12	10
16	9/32	8	8	11/32	10	10	7/16	14	2
18	5/16	10	2	11/32	12	8	7/16	17	0
20	5/16	11	8	3/8	14	10	7/16	20	0
22	5/16	13	2	3/8	17	0	15/32	23	0
24	11/32	14	10	13/32	19	6	15/32	26	0
26	11/32	16	6	13/32	22	0	1/2	29	2
28	11/32	18	4	7/16	24	8	17/32	32	6
30	11/32	20	4	7/16	27	4	17/32	36	0
36	13/32	28	4	15/32	38	0	9/16	48	0
42	7/16	36	4	1/2	48	8	19/32	60	0

Fig. 5601.

TWILL WEAVE WOVEN COTTON BELTING.

This is a solid woven Cotton Belt, of special fine twill weave. It is much appreciated for light drives, such as lathes, drilling machines, fans, etc., where the pulleys are small. It can be supplied either in the natural white state, for elevator webbing, or black proofed, as a driving belt, and combines pliability with strength. Made in two substances, viz., Single and Stout. Made up to and including 12 ins. wide.

Single Strength. 3/16" (4½m/m.) thickness.

Width Inches	Price per ft. s.	d.
¾	5	
1	6½	
1¼	8¼	
1½	9¾	
1¾	11½	
2	1	1
2¼	1	2¾
2½	1	4¼
2¾	1	6
3	1	7½
3¼	1	9¼
3½	1	10¾
3¾	2	0½
4	2	2
4¼	2	3¾
4½	2	5¼
4¾	2	7
5	2	8½
5½	2	11¾
6	3	3
6½	3	6¼
7	3	9½
8	4	4
9	4	10½
10	5	5
11	5	11½
12	6	6

Stout Strength. ¼" (6½ m/m) thickness.

Width Inches	Price per ft. s.	d.
1¼	1	0¼
1½	1	2¾
1¾	1	5
2	1	7½
2¼	1	10
2½	2	0½
2¾	2	2¾
3	2	5¼
3¼	2	7¾
3½	2	10¼
3¾	3	0½
4	3	3
4¼	3	5½
4½	3	8
4¾	3	10¼
5	4	0¾
5½	4	5¾
6	4	10½
6½	5	3½
7	5	8¼
8	6	6
9	7	4
10	8	1½
11	8	11½
12	9	9

Fig. 5602.

INDIARUBBER BELTING — Standard Price List.

Prices per foot.

Width Ins.	2-ply	3-ply	4-ply	5-ply	6-ply	7-ply
1	6d.	7d.	8d.	—	—	—
1¼	7d.	8½d.	9½d.	—	—	—
1½	8d.	9½d.	11d.	—	—	—
1¾	9d.	10¾d.	1/0½	—	—	—
2	10d.	1/–	1/2	—	—	—
2¼	11d.	1/1¼	1/3½	—	—	—
2½	1/–	1/2½	1/5	—	—	—
2¾	1/1	1/3¾	1/6½	—	—	—
3	1/2	1/5	1/8	—	—	—
3¼	1/3	1/6¼	1/9½	—	—	—
3½	1/4	1/7½	1/11	—	—	—
3¾	1/5	1/8¾	2/0½	—	—	—
4	1/6	1/10	2/2	2/6	—	—
4¼	1/7	1/11¼	2/3½	2/7¾	—	—
4½	1/8	2/0½	2/5	2/9½	—	—
4¾	1/9	2/1¾	2/6½	2/11¼	—	—
5	1/10	2/3	2/8	3/1	3/6	—
5½	2/–	2/5½	2/11	3/4½	3/10	—
6	2/2	2/8	3/2	3/8	4/2	—
6½	2/4	2/10½	3/5	3/11½	4/6	—
7	2/6	3/1	3/8	4/3	4/10	5/5

Prices per foot.

Width	2-ply	3-ply	4-ply	5-ply	6-ply	7-ply	8-ply	9-ply	10-ply
7½ ins.	2/8	3/3½	3/11	4/6½	5/2	5/9½	—	—	—
8	2/10	3/6	4/2	4/10	5/6	6/2	6/10	—	—
9	3/2	3/11	4/8	5/5	6/2	6/11	7/8	—	—
10	3/6	4/4	5/2	6/–	6/10	7/8	8/6	9/4	10/2
11	3/10	4/9	5/8	6/7	7/6	8/5	9/4	10/3	11/2
12	4/2	5/2	6/2	7/2	8/2	9/2	10/2	11/2	12/2
13	4/6	5/7	6/8	7/9	8/10	9/11	11/–	12/1	13/2
14	4/10	6/–	7/2	8/4	9/6	10/8	11/10	13/–	14/2
15	5/2	6/5	7/8	8/11	10/2	11/5	12/8	13/11	15/2
16	5/6	6/10	8/2	9/6	10/10	12/2	13/6	14/10	16/2
17	5/10	7/3	8/8	10/1	11/6	12/11	14/4	15/9	17/2
18	6/2	7/8	9/2	10/8	12/2	13/8	15/2	16/8	18/2
19	6/6	8/1	9/8	11/3	12/10	14/5	16/–	17/7	19/2
20	6/10	8/6	10/2	11/10	13/6	15/2	16/10	18/6	20/2
24	8/2	10/2	12/2	14/2	16/2	18/2	20/2	22/2	24/2
28	9/6	11/10	14/2	16/6	18/10	21/2	23/6	25/10	28/2
32	10/10	13/6	16/2	18/10	21/6	24/2	26/10	29/6	32/2
36	12/2	15/2	18/2	21/2	24/2	27/2	30/2	33/2	36/2
40	13/6	16/10	20/2	23/6	26/10	30/2	33/6	36/10	40/2
44	14/10	18/6	22/2	25/10	29/6	33/2	36/10	40/6	44/2
48	16/2	20/2	24/2	28/2	32/2	36/2	40/2	44/2	48/2

Endless Belts charged 3 feet extra.

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BELT FASTENERS.

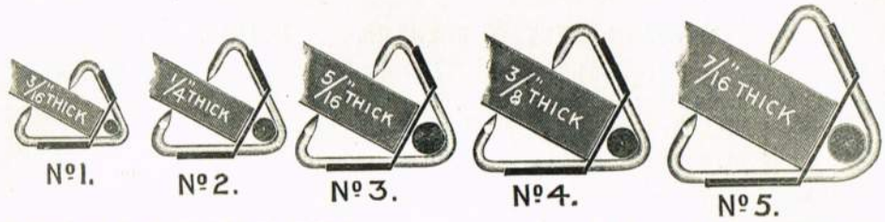

Fig. 5610. "UNIVERSAL" FLEXIBLE BELT HOOKS, with **Metal** Holders.

This fastener comprises a series of wire hooks housed in **metal** holders. Supplied in boxes containing 162 ins. in 6 ins. lengths, with raw-hide pins. Can be used in the "Clipper" belt lacer.

No.	1	2	3	4	5
For Belts, inches	3/16	1/4	5/16	3/8	7/16
Price, box ...	**6/-**	**7/-**	**7/6**	**8/-**	**9/6**

Extra raw-hide pins in bundles of 288 inches, **4/-**.
Extra for special cutters for cutting long lengths, **4/-**.

Fig. 5611. "UNIVERSAL" FLEXIBLE.

For heavy drives, made in heavier gauge steel wire.

No.	3A	4A	5A
For belts .... ins.	5/16	3/8	7/16
Price per box	8/6	9/-	10/6

Cannot be used in the "Clipper" belt lacer.

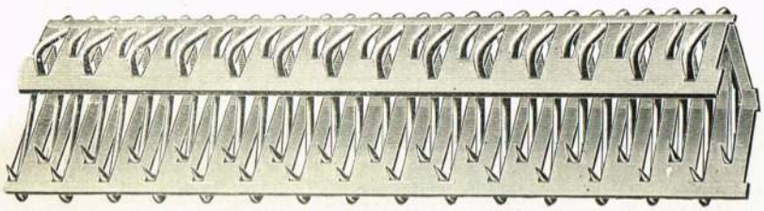

Fig. 5612. "GEM" FLEXIBLE BELT FASTENERS.

The fastener comprises a series of wire hooks housed in a strong paper frame, which is not removed until the hooks are firmly embedded into the belt.

The housing ensures perfect alignment, and when the hooks have been inserted into the belt, the housing is easily removed by the thumb and finger.

Supplied in boxes containing 162 ins. in 6 ins. lengths, with raw-hide pins.

Sizes of Hooks for thickness of Belting:

Fig. 5612.

No. 3 No. 4 No. 5 No. 6

No. 2. Hooks for Belts under 3/16ths.

PRICES:

Nos.	2	3	4	5	6
For belts under	3/16	3/16	1/4	3/8	7/16
Per box	**4/-**	**5/-**	**5/-**	**6/-**	**7/6**

Extra Rawhide Pins in bundles of 288 inches, 4s. each

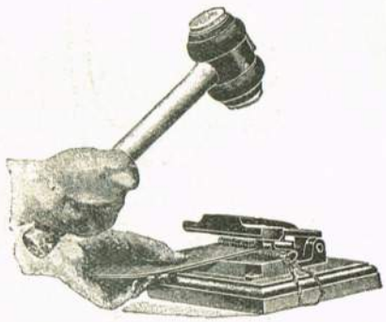

Fig. 5613. "GEM" HAMMERING TOOL.

These are particularly useful in small shops, being a cheap, yet efficient, method of inserting the hooks into the belt. A blow with a mallet closes the hooks flush with the belt.

4 ins. Tool, for belts up to 4 ins. wide in one operation **20/-**
6 ins. Tool, for belts up to 6 ins. wide in one operation **30/-**
Special Heavy Mallet **6/-**

Fig. 5614. "UNIVERSAL" AND "GEM" DOUBLE LEVER BELT LACER.

(British made.)

This machine provides the most efficient method o fixing the hooks into the belt; it can be carried to th belt and a 6 in. joint made at one operation in on minute; if the belt is wider than 6 ins., the operation i repeated; if narrower the standard card of hooks can b cut to the proper width.

This is fully guaranteed against faulty workmanship o material, there are no loose parts, and all parts are inter changeable.

Price **£5 0 0**

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BELT FASTENERS.

AMERICAN BELT FASTENERS. Fig. 5620.

DIRECTIONS.—With an ordinary belt punch make a row of holes in each end of the belt, at such a distance from the ends as to allow the two ends to touch when the hooks are in their place. Insert the fasteners and close the ends with a mallet. To take up belt, raise end of hook and proceed as before.

For belts 1 to 1½ inches. Price per 500.

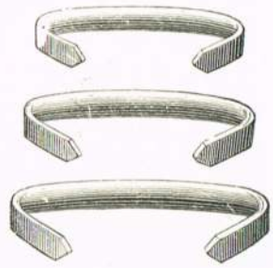
No. **15**, **8**/–

No. **14**, **9/6**

No. **13**, **10/6**

No. **12**, **11**/–

For belts 1¾ to 3½ inches. Price per 500.

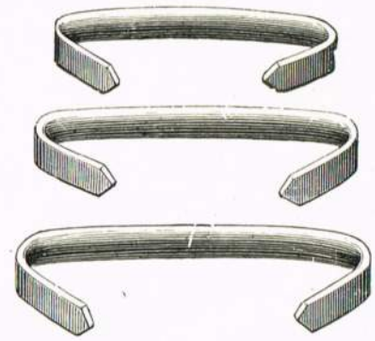


No. **11**, **12**/–

No. **10**, **14**/–

No. **9**, **16**/–

For belts 4 to 8 inches. Price per 500.



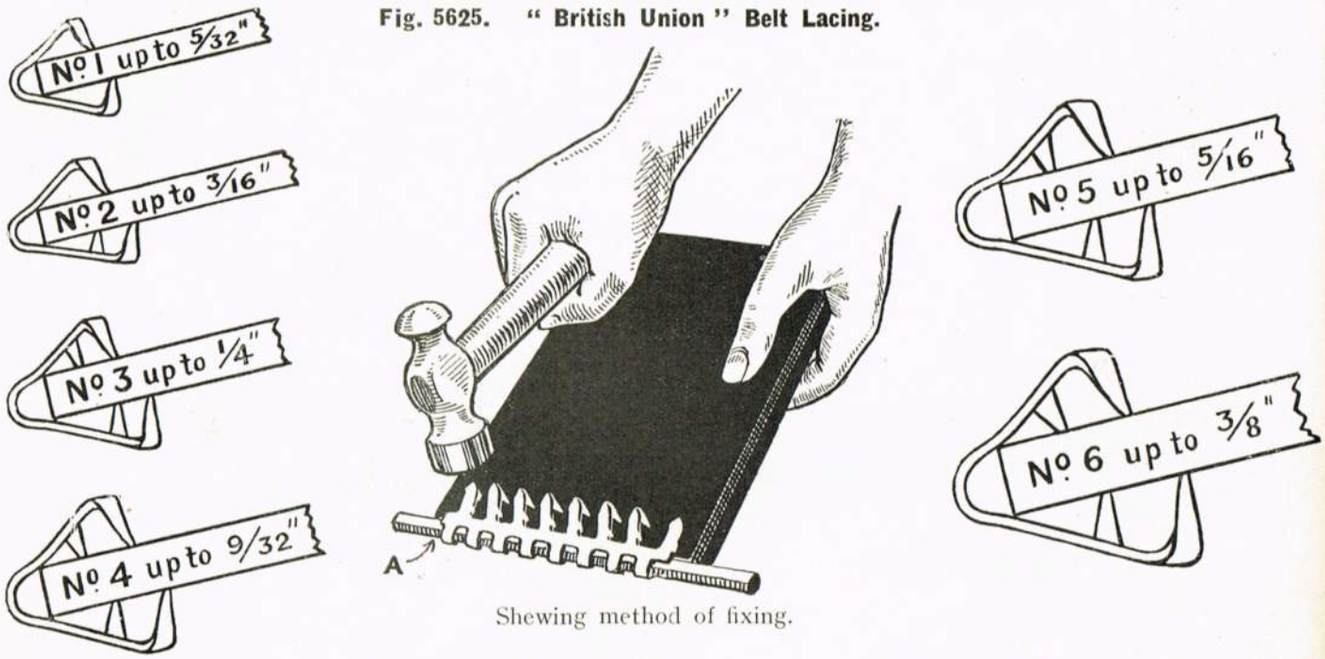
No. **8**, **20/6**

No. **7**, **24/6**

No. **6**, **34/6**

No. **5** .... **44/6** per 500. No. **4** .... **56/6** per 500. No. **3** .... **65**/– per 500.

Fig. 5625. "British Union" Belt Lacing.



Shewing method of fixing.

No.	1	2/15	3/25	4/27	5/35	6/45	7	8/65
Suitable for belting thickness	5/32"	3/16"	7/32"	9/32"	5/16"	3/8"	7/16"	½"
Quantity	16–8" pieces	10–12" pieces	16–12" pieces	16–12" pieces	8–12" pieces	8–12" pieces	8–12" pieces	8–12" pieces
Price per box	**6/6**	**6**/–	**12/9**	**13/9**	**8/6**	**11/6**	**13/9**	**15**/–
Weight	15 ozs.	1¼ lbs.	2 lbs. 10 ozs.	3 lbs.	2½ lbs.	3 lbs.	3½ lbs.	4 lbs.

Rocker Pins .... **2/6** per dozen.

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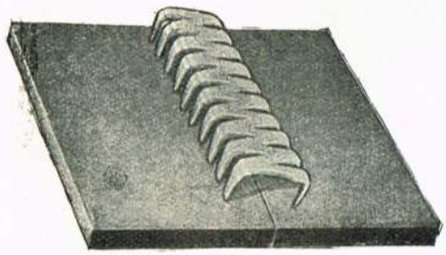
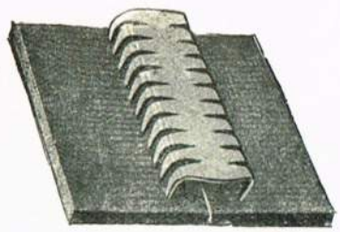
BELT LACING AND FASTENERS.

Illustration of No. **1**, drawn to scale.
Type A.



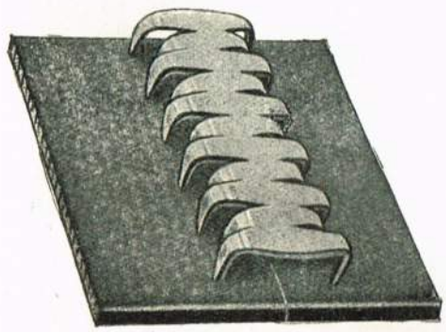
Type A.

Illustration of No. **10**, drawn to scale.



Type B.

Illustration of No. **110**, drawn to scale.



Type C.

BRISTOL PATTERN. Fig. 5627.

TYPE A. SUITABLE FOR LEATHER BELTING.

Each size is boxed containing 100 ins. assorted lengths, 1 in. to 3 ins.

Sizes from **00** to **5**.

Size	Suitable for belts thickness	Weight (about) lbs.	ozs.	Price Per box.
00	$\frac{1}{8}$		4	**4/2**
0	$\frac{1}{8}$ to $^3/_{16}$		10	**4/2**
1	$^3/_{16}$ to $\frac{1}{4}$	1	2	**6/3**
2	$\frac{1}{4}$ to $^5/_{16}$	1	12	**8/4**
3	$^5/_{16}$ to $\frac{3}{8}$	2	2	**10/5**
4	$\frac{3}{8}$ to $^7/_{16}$	3	5	**12/6**
5	$^7/_{16}$ to $^9/_{16}$	3	12	**14/7**

2, 3 or 4 short lengths can be used on a belt to make up the width, with the same satisfactory result.

BRISTOL PATTERN. Fig. 5628.

TYPE B.

SUITABLE FOR ALL KINDS OF BALATA, COTTON, HAIR AND RUBBER BELTING.

Each size is boxed containing 100 ins. assorted lengths, 1 in. to 3 ins.

Sizes from **100** to **17**.

Size	Suitable for belts thickness	Weight (about) lbs.	ozs.	Price Per box.
100	$\frac{1}{8}$		$4\frac{1}{2}$	**4/2**
10	2-ply, $\frac{1}{8}$ to $^3/_{16}$		15	**4/2**
11	3-ply, $^3/_{16}$ to $\frac{1}{4}$		26	**6/6**
12	4-ply, $\frac{1}{4}$ to $^5/_{16}$	2	7	**8/4**
13	5-ply, $^5/_{16}$ to $\frac{3}{8}$	3	3	**10/5**
14	6-ply, $\frac{3}{8}$ to $^7/_{16}$	4	9	**12/6**
15	7-ply, $^7/_{16}$ to $^9/_{16}$	5	14	**14/7**
17	8-ply, $\frac{1}{2}$ to $\frac{5}{8}$	10	0	**20/7**

2, 3 or 4 short lengths can be used on a belt to make up the width, with the same satisfactory result.

BRISTOL PATTERN. Fig. 5629.

TYPE C. SUITABLE FOR ALL BELTING.

Each size is boxed containing 100 ins. assorted lengths, 1 in. to 3 ins.

Sizes **1100** to **119**.

Size	Suitable for belts thickness	Weight (about) lbs.	ozs.	Price Per box.
1100	$\frac{1}{8}$		6	**3/9**
110	$\frac{1}{8}$ to $^5/_{32}$		11	**4/2**
110½	$^5/_{32}$ to $^3/_{16}$	1	2	**5/3**
111	$^3/_{16}$ to $\frac{1}{4}$	1	6	**6/3**
112	$\frac{1}{4}$ to $^5/_{16}$	2	1	**8/4**
113	$^5/_{16}$ to $\frac{3}{8}$	2	15	**10/5**
114	$\frac{3}{8}$ to $^7/_{16}$	3	13	**12/6**
115	$^7/_{16}$ to $^9/_{16}$	5	6	**14/7**
117	$\frac{1}{2}$ to $\frac{5}{8}$	9	6	**20/7**
119	$\frac{5}{8}$ to $^{13}/_{16}$	13	0	**25/3**

2, 3 or 4 short lengths can be used on a belt to make up the width, with the same satisfactory result.

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BELT FASTENERS.

Fig. 5630. Original Button Type Fasteners.

Original Button Fastener.

Nos.	1	2	3
Suitable for belts inches wide	2	4	6
Price per gross	**8/10**	**10/–**	**12/–**
Nos.	4	5	6
Suitable for belts inches wide	8	10	12
Price per gross	**14/–**	**16/–**	**19/6**

Keys for above, **6/–** doz.

Fig. 5631. Original Button Plate Type.

Original Button Plate Fastener.

No.	A	B	C	D
Suitable for belts ins. wide	2	3	4	5
Price per gross	**20/–**	**20/–**	**24/–**	**30/**
No.	E	F	G	H
Suitable for belts ins. wide	6	8	10	12
Price per gross	**36/–**	**40/–**	**50/–**	**55/–**

Slotted Button.

Fig. 5632. Slotted Button Type

	A2	B3	C4	D5	E6	F7	G8
Suitable for belts ins.	2	4	6	8	10	12	—
Price per gross	**10/–**	**12/–**	**14/–**	**16/–**	**19/6**	**25/–**	**30/–**

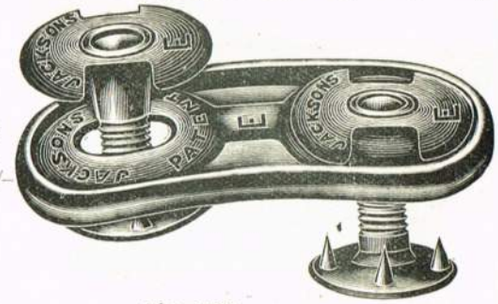


Fig. 5633.

Fig. 5633. Slotted Button Plate Fastener, having taper slots.

Nos.	A	B	C	D	E	F	G	H	I
Suitable for belts ins.	2	3	5	4—6	6—10	8—12	10—14	18	20
Price per gross	**20/–**	**20/–**	**24/–**	**30/–**	**36/–**	**40/–**	**50/–**	**60/–**	**65/–**

Keys for above .... **6/–** per doz

Fig. 5634. Jackson's Pattern Patent Safes.

The patent safes used in connection with the plate fasteners are made to suit all widths of belts from 2″ to 8″, and are a great advantage to the belt, and considerably increase its life. By using these safes you get the strongest and safest joint possible.

Size .... ins.	3	4	5	6	7	8	9	10	11	12	14	15
Price each	**6d.**	**8d.**	**10d.**	**1/2**	**1/6**	**2/–**	**2/2**	**2/6**	**3/–**	**3/6**	**4/6**	**3/9**
Size .... ins.	16	18	20	22	24	26	28	30	32	34	36	40
Price each	**5/6**	**6/6**	**7/6**	**8/6**	**9/–**	**9/6**	**10/–**	**10/6**	**11/–**	**11/6**	**12/–**	**13/–**

Fig. 5635. Original Plate Fastener.

		Small	Large	Small	Large
No.	0	1	1	2	2
Suitable for belts inches	3	4	6	8	10
Price per gross	**36/–**	**36/–**	**40/–**	**50/–**	**60/–**
			Large		
No.		3	3	4	5
Suitable for belts inches		12	18	24	—
Price per gross		**65/–**	—	**80/–**	**100/–**

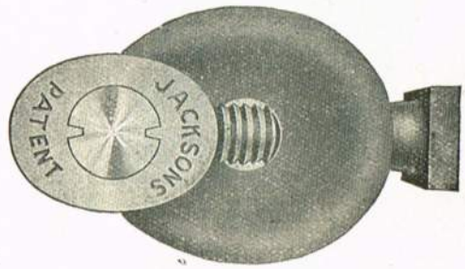


Fig. 5636. Oval Fasteners.

Diam.	$^{3}/_{16}$	$^{7}/_{32}$	$\frac{1}{4}$
Suitable for belts inches	4	6	4—8
Price per gross	**14/–**	**17/–**	**20/–**
			Large
Diam.	$^{5}/_{16}$	$\frac{3}{8}$	$\frac{3}{8}$
Suitable for belts inches	8—10	12—14	Heavy drives
Price per gross	**30/–**	**36/–**	**39/–**

Keys for above ... **6/-** per doz.

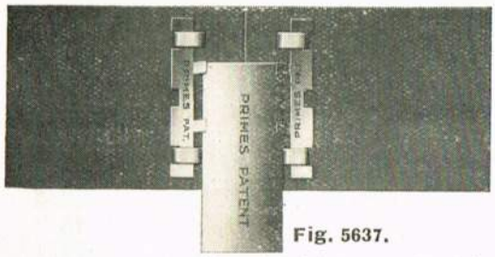
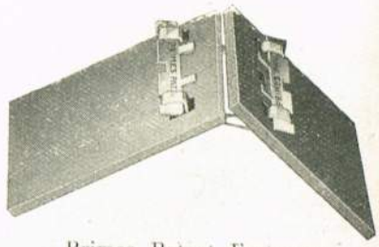


Fig. 5637.

A perfect joint. Used for all kinds of belting. Stand great strain. Self-locking.

Directions for Fixing.

First cut the ends of the belts perfectly square, then place one of the locking bars of the required size on end of belt, taking care that the clips are flush with edge of belt. The slots will then indicate the exact positions of holes to be punched. Then place both ends of belt together, passing hooks through holes and place bars in position (see fig. 2), when the fastener will be in position for insertion of the locking shield (see fig. 3).



Primes Patent Fasteners, showing method of fixing.

Set A.—For 1″, $1\frac{1}{2}$″, $1\frac{3}{4}$″ and 2″ Belts, **10/–**. Set B.—For 1″, $1\frac{1}{2}$, $1\frac{3}{4}$″, 2″, $2\frac{1}{4}$″, $2\frac{1}{2}$″, $2\frac{3}{4}$″, 3″ Belts, **15/–**.
Set C.—Heavy, for belts 1″ to 3″, belts about 7 ft. long, joints, **27/6.**

Extra parts—Hooks, **1/6** doz. 4″ Locking Bars, **1/2** per doz. Locking Shields, $1\frac{1}{2}$″ **7d.**, $1\frac{3}{4}$″ **8d.**, 2″ **9d.**, $2\frac{1}{4}$″ **10d.**, $2\frac{1}{2}$″ **1/–** doz.
The 1″ is obtained by cutting 2″ in halves and 3″ by using two $1\frac{1}{2}$″ shields.

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LACING AND BELT FASTENERS.

Green's Pattern Belt Fasteners.

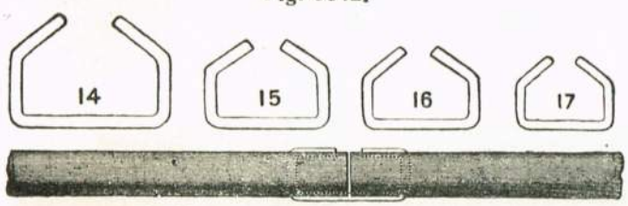
GREEN'S PATTERN BELT FASTENERS.

Fig. 5641.

Nos.	5	4	3	2
Price per box of 100	**2/–**	**2/6**	**3/–**	**3/6**
Nos.	1	0½	0	00
Price per box of 100	**4/6**	**5/–**	**5/6**	**6/6**

STEEL BELT HOOKS FOR ROUND BELTING.

Fig. 5642.



In boxes of 500, at per 1,000.

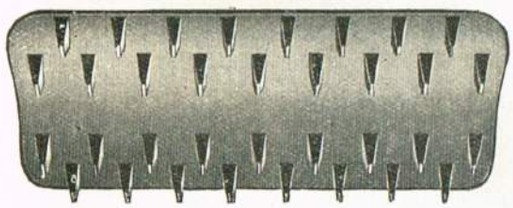
For ⅜ Belting	For 5/16 Belting	For ¼ Belting	For 3/16 Belting
5/–	**4/6**	**4/–**	**3/6**

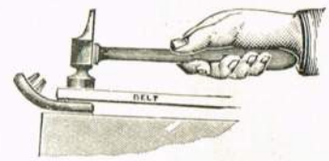
STEEL HOOKS AND EYES FOR ROUND BANDING. Fig. 5643.

Sizes up to ¼ in., **6/–** per dozen pairs.

9/32	5/16	⅜	7/16	½	9/16
7/–	**8/–**	**12/–**	**18/–**	**24/–**	**32/–**
⅝	11/16	¾	13/16	⅞	1 in.
40/–	**48/–**	**56/–**	**70/–**	**86/–**	**124/–**

HARRIS PATTERN BELT FASTENERS. Fig. 5644.

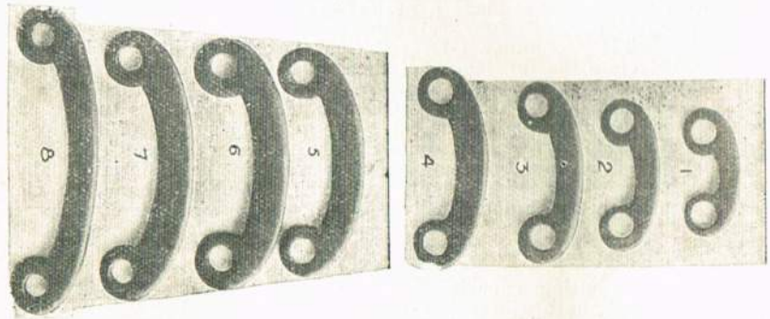




Method of fixing Harris Pattern Belt Fasteners.

Manufactured from Best Malleable Iron.

Suitable for belts	½″	¾″	1″	1¼″	1½″	1¾″	2″	2¼″	2½″	2¾″	3″	3¼″	3½″	3¾″	4″	4¼″	4½″	5″
Price per gross	**4/–**	**5/–**	**6/–**	**6/–**	**8/–**	**8/–**	**10/–**	**11/–**	**12/–**	**13/–**	**14/–**	**15/–**	**16/–**	**17/–**	**18/–**	**19/–**	**20/–**	**30/–**



LION OR BUTT JOINT FASTENERS.

Fig. 5645. Butt Joint Pattern.

No.	1	2	3	4	5	6	7	8
Price—Box of 100	**3/2**	**4/2**	**5/6**	**5/10**	**6/2**	**8/–**	**8/8**	**9/–**

Fig. 5646. Steel Cotters for above.

Length	1	1½	2	2½	3	3½	4	4½	5	5½	6
Price per 100	**1/8**	**2/–**	**2/4**	**2/10**	**3/3**	**3/6**	**4/4**	**4/10**	**5/8**	**6/4**	**12/2**

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HACK SAW MACHINES.

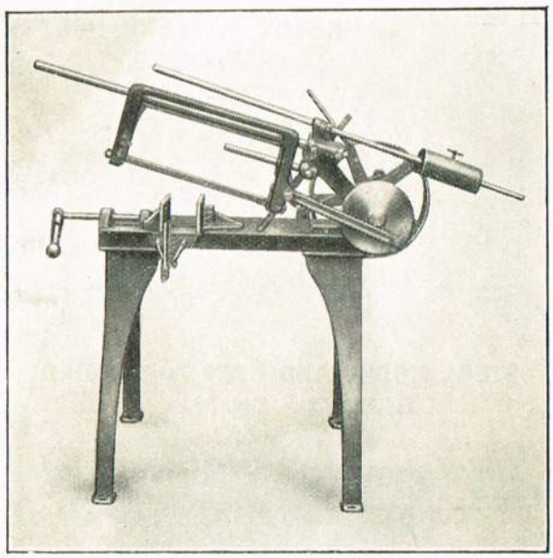

Fig. 6000. Hacksaw Machine, with swivel vice, designed to take saws up to 14″. The frame is of heavy construction and supported at two points. The saws are firmly held in a special device. On the return stroke the frame is slightly lifted giving clearance, therefore increased life to the blade. The weight is adjustable for pressure when sawing delicate work. The vice will hold up to 6″ diameter. A special feature is the outward support to the work being cut. At the completion of the cut all strain is taken off the saw. The Machine is self-feeding, requires no attention when in use and automatically stops when the cut is complete. Weight 180 lbs. Price **£8 0 0** each.

Fig. 6001. Goodell Bench Hack Saw. No. 6.

This Machine will be found useful in any shop where power is not available. By its use, even an unskilled operator can cut metal rods or tubing rapidly and smoothly without breaking Blades. The Vice attached to the Bed can be set to saw at any desired angle.

Made entirely of iron and steel this machine is capable of long service under hard use. Iron parts are all finished in red and black enamel. Either 8″ or 9″ Blades can be used.

Height, 10¼″. Base, 10¾″ x 3¾″. Stroke, 6¾″. Vice has 2¼″ jaws that open 2″. Extreme capacity, 2″ x 2″. Net weight, 10¾ lbs.

Price complete with one 9″ Blade, **37/6** each.

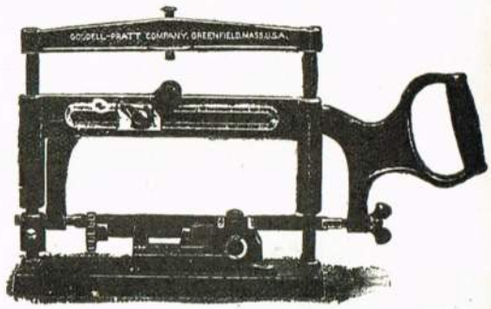

Fig. 6001.

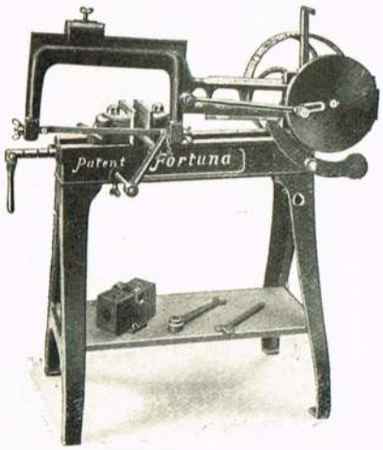

Fig. 6002. New " Fortuna " Power Hack Saw.

ALL PARTS are machined on special machinery in jigs and to accurate gauges, rendering the parts interchangeable, and is a really modern and reliable machine tool.

ALL WORKING PARTS are made unusually strong.

THE DRIVING SHAFT rotates in the cylindrical extension of the swivelling bracket independently of the bearing of this bracket. The accuracy of the guide of the saw frome cannot be affected by any wear which may take place in the running shaft.

THE SAW FRAME works on accurately machined adjustable V slide bearings, giving the saw blade a perfect and steady guide. A dead square cut is thus obtained, even after years of wear.

THE STROKE OF THE SAW is easily adjustable between 3 and 8 inches, therefore the full length of the saw blade can be used, regardless of the size of the work to be sawn.

THE UNIVERSAL VICE is patented and offers unique advantages. Every variety of section can be cut. The gripping surface of the vice-jaws is exceptionally wide and reaches quite close to the saw blade. The jaws are swivelled in such a manner that both ends always grip the material equally near to the saw blade. The Spindle is threaded right and left hand, so clamping the work instantly and automatically central to the saw's limit of reciprocation.

Stops Automatically on completion of cut.

The Automatic Features of the Machine permit of its being operated to full advantage by unskilled labour.

Tested before leaving the works under actual working conditions.

Specification.

Made in two sizes.

Cutting capacity	**6″ x 6″**	**8″ x 8″**
Length of saw blade	12″	14″
Stroke adjustable, from	3″ to 8″	2″ to 4″
Size of pulley	12½″ x 2¼″	14″ x 2¼″
Speed of pulley	85 to 90 r.p.m.	100 to 110 r.p.m.
Height of bed	27¼″	15¾″
Floor space required	48″ x 20″	48″ x 20″
Net weight, approx.	188 lbs.	188 lbs.
Price, each	**£10 0 0**	**£11 10 0**

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POWER HACK SAW MACHINES.

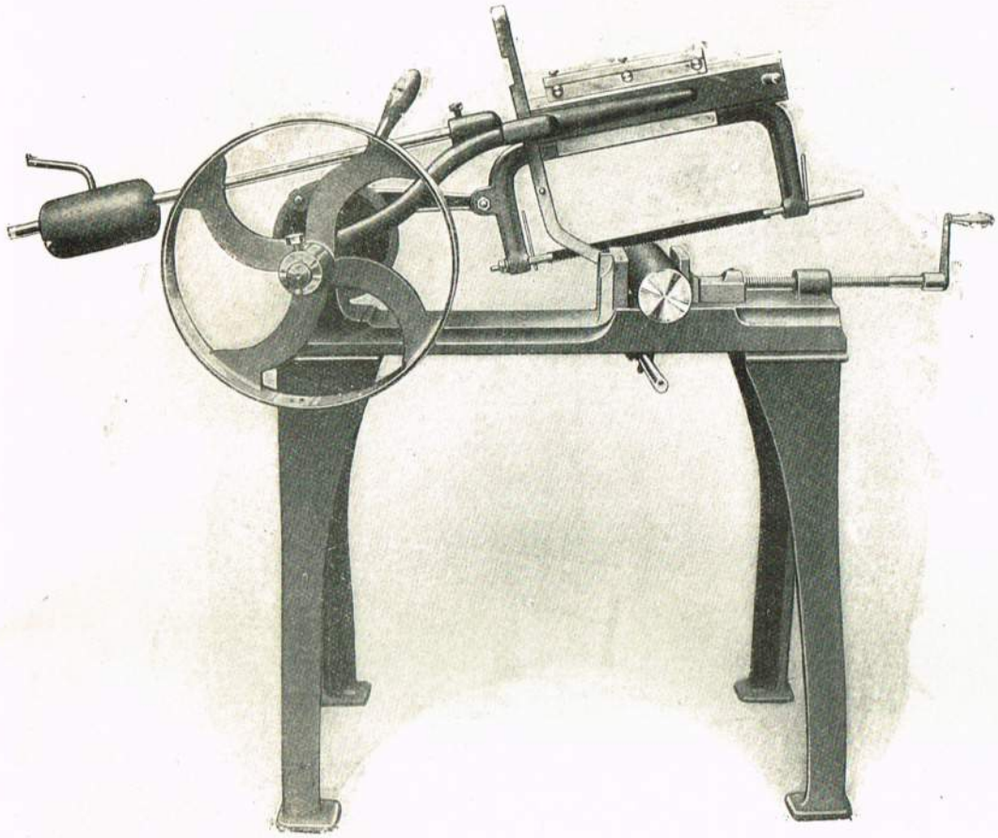

Fig. 6003.

"D 1" PATTERN

This machine is designed to meet the demand for a cheap but good saw.

Though cheap, it is a well-made machine in every respect.

Saw Bow works on **V** Slide, and is adjustable for wear.

Pulley 14 × 2½ in. ; Speed 60 to 70 revolutions.

Capacity, 5 in. × 5 in.

Approx. weight, 155 lbs.

No. **D 1**.

Price £**6** **7**s. **6**d. each

When ordering it is only necessary to state "D1."

If packed for export price would be **40/-** each extra nett.

Size of case :
30 in. × 19 in. × 21 in.

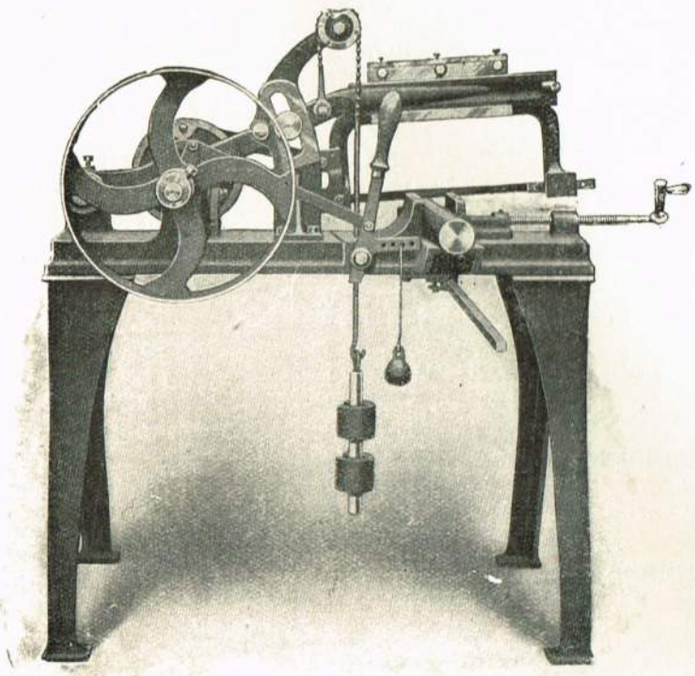

Fig. 6004. **"B 1" PATTERN.**

Driving Pulley for B1 and B2—14in. dia. × 2½ in. wide.

For B3—14 in. dia. × 3 in. wide.
Revolutions—48/60 per minute.

No. **B1**.

Capacity, 4½ in. × 4½ in. Weight, 170 lbs.

Price, £**8** **5**s. **0**d. each nett, f.o.r. these works.

No. **B2**.

Capacity, 4½ in. × 4½ in. Weight, 200 lbs.

Price, £**11** **12**s. **6**d. each nett, f.o r. these works.

No. **B3**.

Capacity, 6½ in. × 6½ in. Weight, 224 lbs.

Price, £**13** **5**s. **0**d. each.

If packed for export price would be **40/-** each extra nett.

Size of cases—

For **B1** and **B2**, 22 in. × 20 in. × 40 in.
For **B3** .... 26 in. × 19 in. × 42 in.

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"ACME" PATENT SINGLE SAWING MACHINE

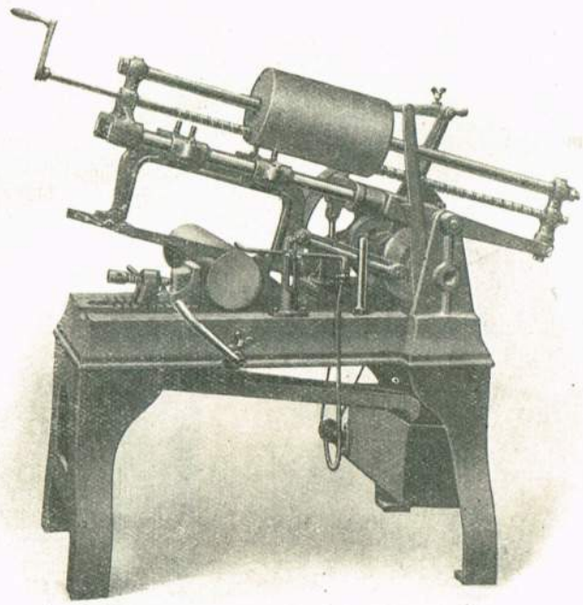

Fig. 6005. Illustration of 6″ Machine.

These machines will cut at the rate of from 1½ to 2 superficial circular inches per minute the day through.

	Average Time.	Extreme Speed.
5″ Machine will cut a 5″ Round Bar in	12 to 20 minutes ...	10 minutes.
6″ Machine will cut a 6″ Round Bar in	18 to 30 minutes ...	12 minutes.

Specification and Prices.

Capacity—Round, Square and other sections up to	5″	6″
Power required	½ H.P.	½ H.P.
Speed of Machine—Mild Steel with Suds	130 rpm.	120 rpm.
,, ,, Cast Steel with Suds	70 rpm.	70 rpm.
,, ,, Cast Iron without Suds	70 rpm.	70 rpm.
Size of Fast and Loose Pulleys on Machine	13½″ x 2½″	16″ x 2½″
Two Speed Countershaft should run at	90 rpm.	90 rpm.
Height of Vices	2¾″	3⅛″
Stroke	5¼″	5½″
Floor Space	3′ 11″ x 1′ 8″	4′ 3″ x 2′ 3″
Weight of Machine	4 cwt. 0 lbs.	7 cwt. 2 qrs. 14lbs.
Shipping Particulars—Gross Weight	5 cwt. 1 qr.	7 cwt. 2 qrs. 14 lbs.
,, ,, Measurements	4′ 2″ x 2′ 3″ x 1′ 11″	4′ 6″ x 2′ 7″ x 2′ 2″
	£ s. d.	£ s. d.
Complete with Lifting Ram, Sud Pump, Tank, connections and setting bar...	26 10 0	32 10 0
Same Machine fitted with long frame to take bars up to 9″	.....	34 10 0
Automatic Stop for Machines fitted with Fast and Loose Pulleys only... extra	1 5 0	1 5 0
Two Speed Countershaft with cone for machine ... ... ,,	5 5 0	6 0 0
Three Speed Gears complete with automatic stop	6 15 0	7 10 0
Motor Drive (as illustrated page 4) complete with D.C. Motor and Switches ,,	27 0 0	27 0 0
Angle Vice to cut up an angle of 45° (as illustrated page 15) ... ... ,,	0 15 0	0 18 0
Roller Stand for long bars	1 2 6	1 10 0

Suitable Saw Blades.

For 5″ Machine.	Gross. £ s. d.	For 6″ Machine.	Gross. £ s. d.
10″ x ⅜″ x 19G to cut bars up to 3″	4 1 3	12″ x 1″ x 18G to cut bars up to 5″	6 2 6
12″ x 1″ x 18G to cut bars up to 5″	6 2 6	13″ x 1″ x 18G to cut bars up to 6″	6 12 9

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"ACME" PATENT SINGLE SAWING MACHINES.

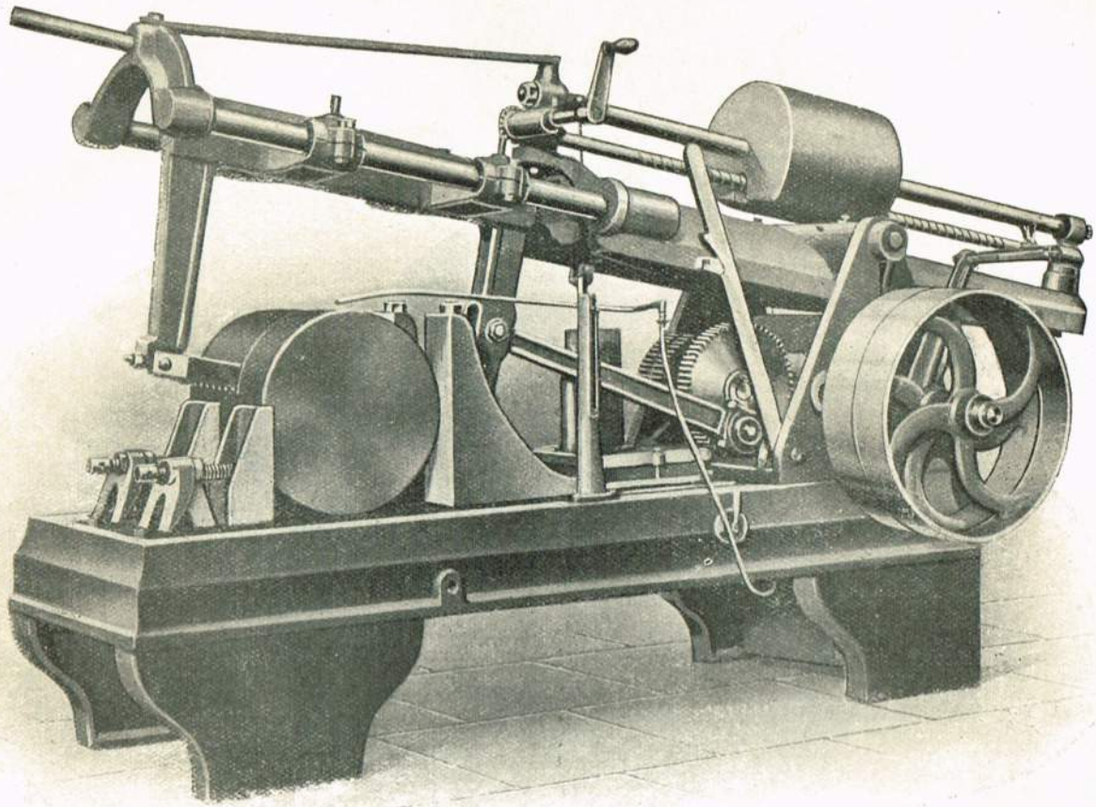

Fig. 6006. Illustration of 10″ Machine. "MASSIVE" Pattern.

SPECIFICATION AND PRICES OF "MASSIVE" SAWS.

Capacity:—Round, Square, and other sections up to	8″	10″	12″	15″	16″×20″	20″
Power required	½HP.	1HP.	1HP.	2HP.	2HP.	2HP.
Speed of Machine:—Mild Steel with Suds...	120 rpm.	120 rpm	110 rpm.	90 rpm.	90 rpm.	80 rpm.
" " Cast Steel with Suds...	70 rpm.	60 rpm.	55 rpm.	50 rpm.	45 rpm.	40 rpm.
" " Cast Iron without Suds	70 rpm.	60 rpm.	55 rpm.	50 rpm.	45 rpm.	40 rpm.
Size of Fast and Loose Pulleys on Machine	20″×2½″	20″×3″	12″×3″	16″×3″	20″×4″	26″×4″
				Gear 1½ to 1.		
Two Speed Countershaft should run at	90 rpm.	80 rpm.	—	—	—	—
Size of Fast and Loose Pulleys on Countershaft	20″×2½″	20″×3″	—	—	—	—
Height of Vices:—Loose Jaw	4¼″	5″	6½″	7¾″	8¼″	10¼″
" " Fixed Jaw	4¼″	9⅛″	12″	15″	16″	20″
Stroke	5½″	6″	6½″	7″	7″	8″
Floor Space	4′ 3″×2′ 3″	5′ 6″×2′ 7″	7′ 6″×2′ 8″	9′ 0″×3′ 0″	9′ 3″×2′ 9″	10′ 3″×3′ 4″
Weight of Machine complete	7cwt. 3qrs.	12cwt.	20cwt.	25cwt. 3qrs.	29cwt.	37cwt.
Shipping Particulars:—Gross Weight	9cwt. 1qr.	14cwt.	23cwt.	30cwt. 0qrs.	34cwt.	42cwt.
" " Measurements	4′ 7″×2′ 9″ ×2′ 3″	5′ 5″×2′ 9″ ×3′ 2″	6′ 9″×3′ 3″ ×3′ 9″	8′ 8″×3′ 9″ ×4′ 3″	9′ 0″×4′ 3″ ×3′ 9″	10′ 0″×4′ 6″ ×3′ 0″
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Complete with Patent Four Function Hydraulic Ram, Sud Pump, Tank, Connections and Setting Bar	**42 10 0**	**60 10 0**	**101 10 0**	**128 10 0**	**150 0 0**	**160 0 0**
Automatic Stop for Machines fitted with Fast and Loose Pulleys ONLY ... ... extra	**1 5 0**	**1 10 0**	**1 10 0**	**1 10 0**	**1 10 0**	**1 10 0**
Two Speed Countershaft with Cone for Machine... ... extra	**6 0 0**	**6 15 0**	—	—	—	—
Three Speed Gears complete, with Automatic Stop (Illustrated page 4)	**9 0 0**	**9 0 0**	**9 15 0**	**12 0 0**	**12 15 0**	**13 10 0**
Motor Drive (Illustrated page 4), complete with D.C. Motor and Switch	**27 0 0**	**33 0 0**	**33 0 0**	**42 0 0**	**42 0 0**	**42 0 0**
Single Vice to cut up to 45° (page 15)	**0 18 0**	**1 2 6**	**1 2 6**	**1 10 0**	**1 10 0**	**1 10 0**
Roller Stand for long Bars	**1 10 0**	**1 17 6**	**2 12 6**	**3 7 6**	**3 7 6**	**3 7 8**

SUITABLE SAW BLADES.

	Doz.	Gross. £ s. d.
8″ Machine—		
13″×1″×18G for Bars up to 5″	**11/1**	**6 12 9**
14″×1¼″×18G " " 6″	**15/4**	**9 3 9**
16″×1¼″×17G " " 8″	**17/6**	**10 10 0**
10″ Machine—		
14″×1¼″18G " " 6″	**15/4**	**9 3 9**
16″×1½″×17G " " 8″	**25/4**	**15 3 4**
18″×1½″×17G " " 10″	**28/6**	**17 1 3**
12″ Machine—		
16″×1½″×17G for Bars up to 6″	**25/4**	**15 3 4**
18″×1½″×17G " " 8″	**28/6**	**17 1 3**
20″×1¾″×17G " " 10″	**37/6**	**22 10 0**
22″×2″ ×17G " " 12″	**47/9**	**28 13 0**

	Doz.	Gross. £ s. d.
15″ Machine—		
18″×1¾″×17G for Bars up to 9″	**28/6**	**17 1 3**
20″×1¾″×17G " " 11″	**37/6**	**22 10 0**
22″×2″ ×17G " " 13″	**47/9**	**28 13 0**
24″×2″ ×17G " " 15″	**52/1**	**31 5 0**
20″ Machine—		
20″×2″×17G for Bars up to 8″	**43/5**	**26 1 0**
22″×2″×17G " " 10″	**47/9**	**28 13 0**
24″×2″×17G " " 12″	**52/1**	**31 5 0**
26″×2″×16G " " 14″	**61/8**	**37 0 0**
28″×2″×16G " " 16″	**66/8**	**40 0 0**
30″×2″×16G " " 18″	**71/8**	**43 0 0**
32″×2″×16G " " 20″	**83/4**	**50 0 0**

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HACK SAW MACHINE

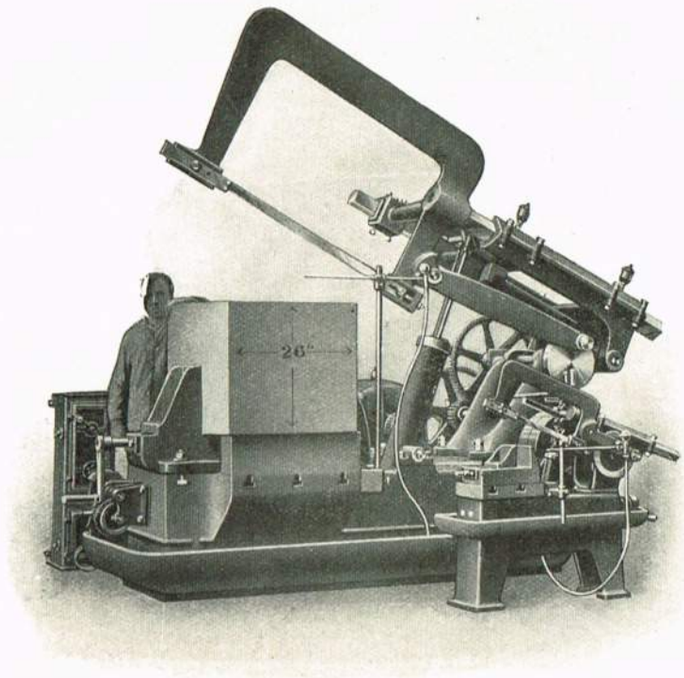

Fig. 6007. No. 4 RAPID HACK-SAW MACHINE.

This machine was originally designed for the Admiralty for sawing billets of oil-hardened gun steel, 26″ square.

It is equally suitable for sawing steel billets or sections of cast iron.

The machine has an automatic lift to the saw on the return stroke, and is fitted with worm gearing for raising and lowering the frame from the front of the machine, adjustable spring counter-balance with dial indicator for altering the pressure of the blade, fast and loose driving pulleys, with belt-striking gear and adjustable stop for automatically stopping the machine at the end of cut or at any depth. Each machine is provided with heavy screw vice, opening 26″, and capable of being swivelled on the T slotted bed, for making angular cuts; outside support for the job; suds pump with tray and fittings, spanners, handles, and one blade.

SPECIFICATION.

Saw blades, 24″ to 39″ x 2″ wide.

Weight	$3\frac{3}{4}$ tons net.	Speed	60 R.P.M.
Pulleys	36″ x 5″	Floor space	10′ 6″ x 6′
Power	$3\frac{1}{2}$ H.P.		

Price on application.

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JIG SAW.

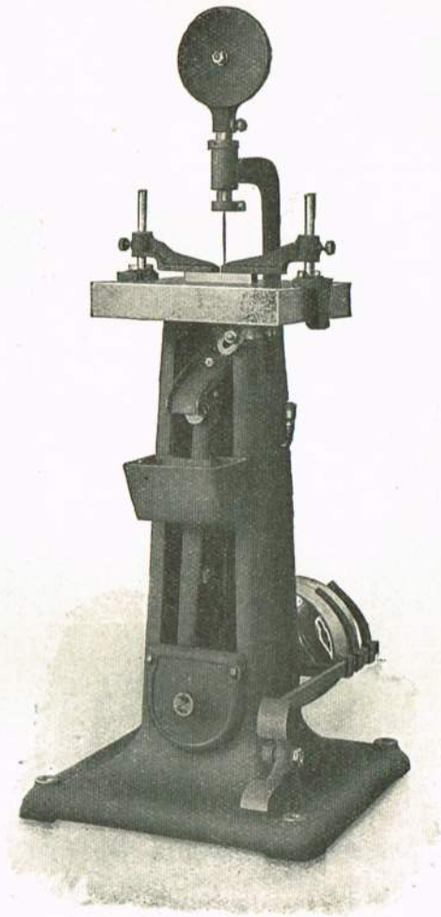

Fig. 6008. THE RAPID JIG SAW, with Filing Attachment.

The machine is specially designed for sawing out dies, metal patterns, and sheet templets.

FILE HOLDERS are supplied with each machine to enable the work to be finished by filing.

THE TABLE is 15″ square, and can be tilted 10 degrees either way, so that dies can be cut with the necessary clearance. A work stay is provided, and can be placed in various positions to suit the work dealt with.

THE SAWS will cut any material from brass to tool steel. They are supplied in coils which fit in the magazine above the saw frames. The holders take saws up to $\frac{5}{8}$″ wide. The saws should be set with a rake of about $\frac{1}{8}$″ to increase the cutting action and allow the blade to clear the work on the up stroke.

THE STROKE is adjustable from 0″ to 4″. The height from table to saw holder, with saw frame in lowest position, is 3″ on the maximum stroke. The main slide is square, sliding in long bearing adjustable for wear. The connecting rod ends are adjustable for wear.

Each machine is supplied complete with holders for saws and files, work stay, box for cuttings, magazine and one coil of saw blade, fast and loose driving pulleys, and belt-striking gear, and necessary spanners.

SPECIFICATION.

Coils of saw blade, $\frac{3}{16}$″, $\frac{1}{4}$″, and $\frac{3}{8}$″ wide x 50′; $\frac{5}{8}$″ wide x 25′.

Weight	440 lbs. net; 600 lbs. gross	Floor space	24″ x 32″
Measurement	35 cubic feet	Height to table	39″
Pulleys	10″ x 3″		

Price on application.

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PUNCHING AND SHEARING MACHINES.

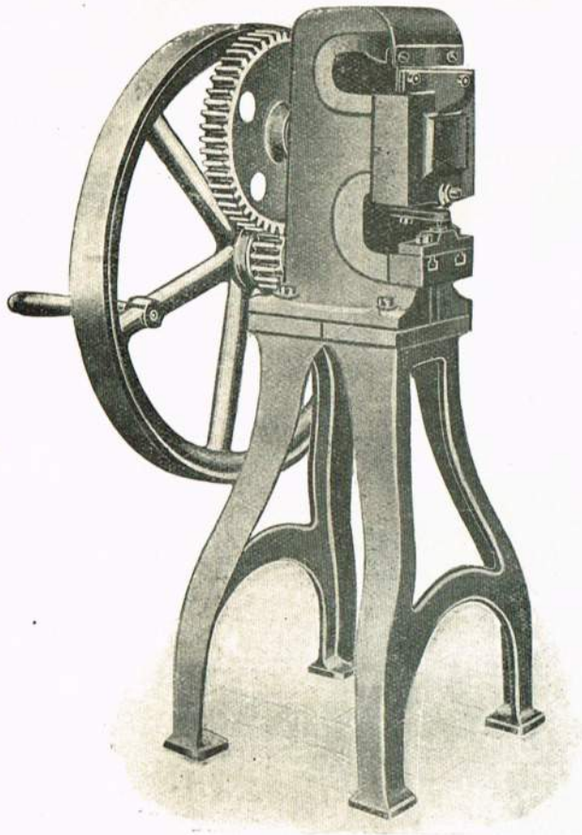

Fig. 6009.

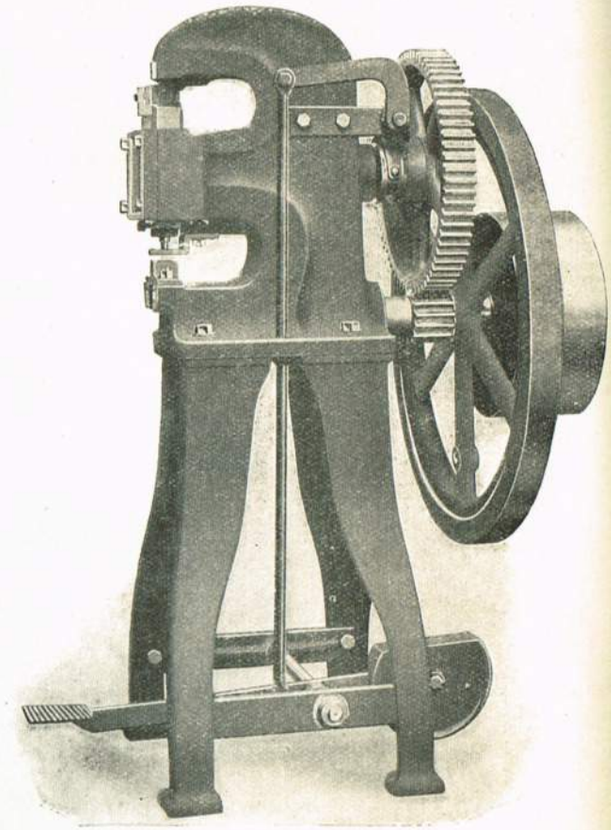

Fig. 6010.

IMPROVED HAND AND POWER PUNCHING AND SHEARING MACHINES.

These shears represent the latest production and are really most useful and substantially made tools. Fitted with strong machine-cut from the solid gears. Heavy well-balanced fly-wheel. The complete casting of box section. They are designed with punch underneath the shear, and will do the work specified with ease. The prices below include machines fitted with one punch and die and one pair of shears. **Fig. 6009** shows Machine No. 1 arranged for hand power, with stand to floor. **Fig. 6010** shows No. 1A machine fitted with fast and loose pulley and arranged with treadle clutch motion. The work can be placed in position for working with the slide out of motion, and the machine can then immediately be thrown into gear by the release of the treadle. The arrangement can be fitted to either machine.

PRICES.

Size	To Punch	Through	Shear	Depth of gaps	Approx. weight
1	$\frac{3}{8}''$	$\frac{1}{4}''$	$\frac{1}{4}''$	4″ punch, 4″ shear	4 cwts.
1A	$\frac{1}{2}''$	$\frac{3}{8}''$	$\frac{3}{8}''$	6″ ,, 6″ ,,	6 cwts.

Size	Price	Extra for stand	Extra for pulleys	Extra for stop motion as shewn	Extra punches and dies Round	Extra punches and dies Square	Extra shear blades
1	**£16**	**40/–**	**50/–**	**£7 0 0**	**16/–**	**20/–**	**20/–**
1A	**£28**	**50/–**	**50/–**	**£7 0 0**	**16/–**	**20/–**	**25/–**

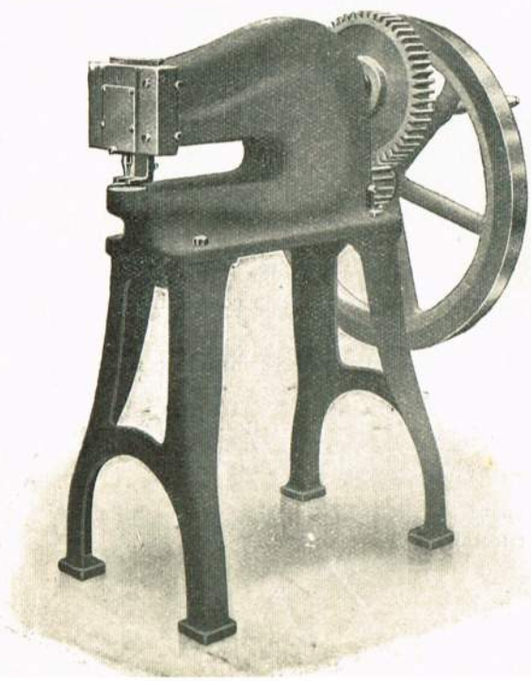

Fig. 6011.

SPECIAL DESIGN DEEP GAP PUNCHING MACHINE.

Specially designed to admit large work. Will punch holes 15″ from edge of plate.

PRICE complete with punch and die:

Size	To punch	Through	Gap	Approx. weight	Price
13	$\frac{1}{4}''$ diam.	$\frac{1}{4}''$ thick	15″ deep	5 cwts.	**£28**

Size	Extra for stand	Extra for fast and loose pulleys	Extra for stop motion	Extra punches and dies Round	Extra punches and dies Square
13	**£2 10 0**	**£2 10 0**	**£2 10 0**	**16/–**	**20/–**

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PUNCHING AND SHEARING MACHINES.

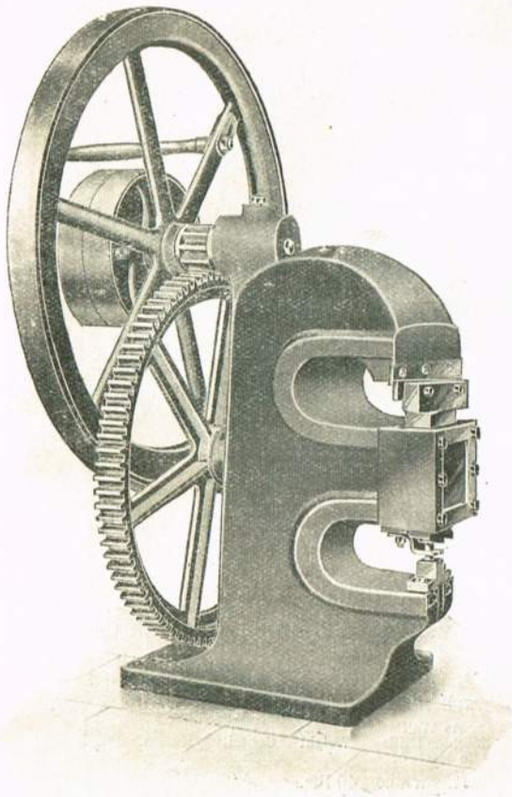

Fig. 6012.

IMPROVED PUNCHING AND SHEARING MACHINE.

For Contractors, Blacksmiths and Coachbuilders.

Very strong, heavy design, constructed to withstand hard and constant use, and made to do the work with ease, by hand or power, as specified. Fitted with punch and shearing tools. Shears set at an angle for cutting off long bars. Strong gears, heavy fly-wheel.

PRICE, with one punch and die, and one pair of Shear blades:

Size	To punch	Through	Shear	Depth of gaps
2	$\frac{5}{8}''$	$\frac{3}{8}''$	$\frac{3}{8}''$	8″ punch and 8″ shear
2A	$\frac{5}{8}''$	$\frac{1}{2}''$	$\frac{1}{2}''$	8″ ,, ,, 8″ ,,
2B	$\frac{3}{4}''$	$\frac{5}{8}''$	$\frac{5}{8}''$	12″ ,, ,, 11″ ,,

No.	Approx. weight	Price	Extra for pulleys	Extra for stop motion	Extra Punches and dies Round	Square	Extra Shear blades
2	13 cwts.	**£36**	**£4**	**£4 10 0**	**16/–**	**20/–**	**30/–**
2A	14 cwts.	**£40**	**£6**	**£4 10 0**	**16/–**	**20/–**	**30/–**
2B	20 cwts.	**£52**	**£6**	**£5 0 0**	**18/–**	**22/–**	**36/–**

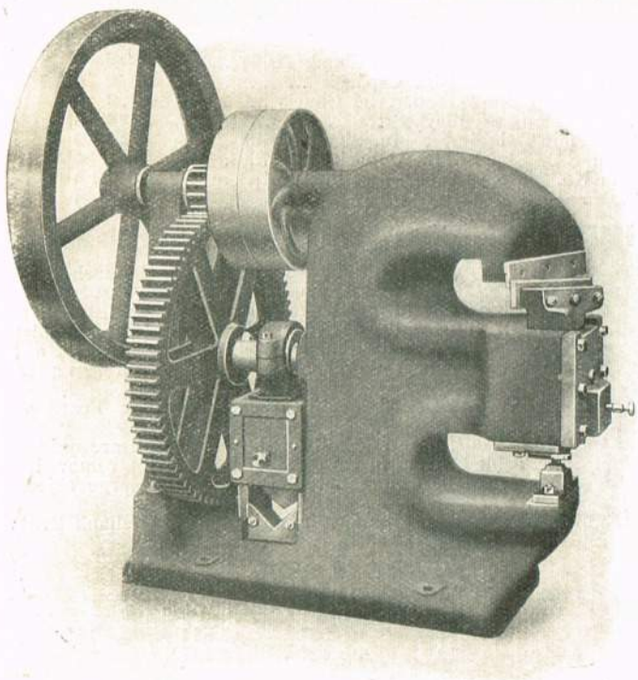

Fig. 6013.

PUNCHING AND SHEARING MACHINE of Powerful Design.

With or without Angle-iron Shears.

These are powerful single-ended punching and shearing machines. Shears set at an angle. Strong heavy body casting, and gearing with specially designed slide blocks and stop motion. Heavy fly-wheel. Steel eccentric shaft, fast and loose pulley with belt striker, and additional bearing to carry fly-wheel.

Sizes 8 and 9 are fitted with extra heavy double purchase.

PRICE with one punch and die, and one pair of shears:

Size	To punch ins.	Through ins.	Shear ins.	Depth of gaps.	Price for power	Approx. weight cwts.	Price with angle-iron shears	Approx. weight cwts.	Extra punches and dies Round	Square	Extra shear blades	Extra angle blades
3	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	9″ punch and 9″ shear	**£52**	17	**£68**	18	**16/–**	**20/–**	**30/–**	**40/–**
4	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	12″ ,, 11″ ,,	**£66**	25	**£84**	26	**18/–**	**22/–**	**36/–**	**50/–**
5	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	14″ ,, 14″ ,,	**£90**	40	**£110**	42	**20/–**	**24/–**	**56/–**	**70/–**
6	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	15″ ,, 15″ ,,	**£130**	50	**£152**	53	**24/–**	**28/–**	**56/–**	**90/–**
7	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	18″ ,, 18″ ,,	**£190**	75	**£220**	80	**24/–**	**28/–**	**90/–**	**110/–**
8	1	1	1	15″	**£150**	52	**£174**	55	**24/–**	**28/–**	**76/–**	**90/–**
9	1	1	1	18″	**£210**	80	**£240**	85	**24/–**	**28/–**	**90/–**	**110/–**

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DRILLING MACHINES.

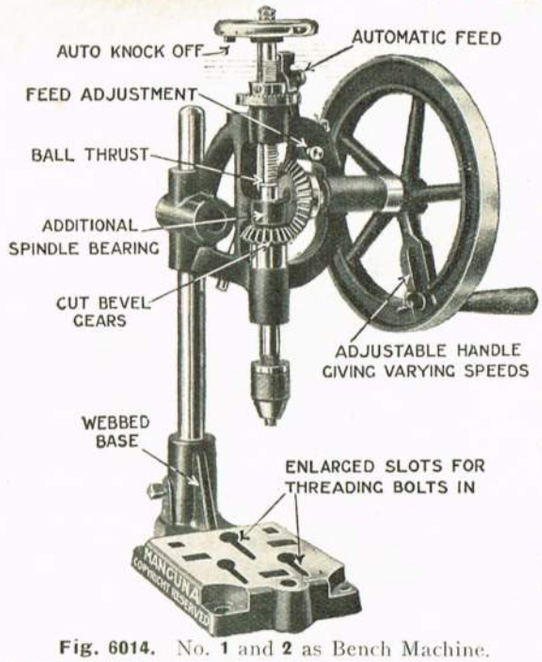
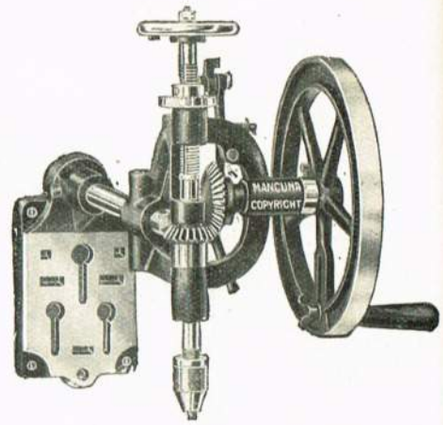


Fig. 6014. No. **1** and **2** as Bench Machine.

Improved Wall and Bench Drilling Machines for Hand or Power.

These machines are well made, rigid in use, fitted with machine cut gears and a ball thrust on the drill spindle. Variable automatic feed actuated by a cam on end of fly-wheel spindle, which can be put out of action if desired. Handle can be adjusted, giving speed variation. Improved base, taking up little room, with holding down bolts below surface level. This machine can be easily bolted to a chassis frame for drilling, or other work of a similar nature.



No. **1** and **2** as Wall Machine.

This illustration shows the machine fixed to a wall, and will, therefore, permit the drilling of large articles.

SPECIFICATION.

Size	Drills Holes up to	Depth of Feed.	As Bench Machine Drills to centre of	As Wall Machine Drills to centre of	Weight	Capacity of Chuck	Morse Taper	Max. distance Spindle to Table
No. 1	⅝″	2½″	12″ surface	3 ft. surface	40 lbs.	½″	No. 1	7″
No. 2	1″	4″	16″ surface	4 ft. surface	100 lbs.	¾″	No. 2	18″

Fig. 6014. PRICES.

	£	s.	d.
No. 1, with Plain Spindle for ½-in. Shank Drills	2	15	0
No. 1, with S.C. Chuck ½-in. Capacity	3	0	0
No. 1, with No. 1 Morse Taper, no Chuck	3	0	0
No. 1, Fast and Loose Pulleys extra	0	10	0
No. 2, with Plain Spindle for ½-in. Shank Drills	5	15	0
No. 2, with S.C. Chuck ¾-in. Capacity	6	10	0
No. 2, with No. 2 Morse Taper, no Chuck	6	10	0
No. 2, Fast and Loose Pulleys extra	0	15	0

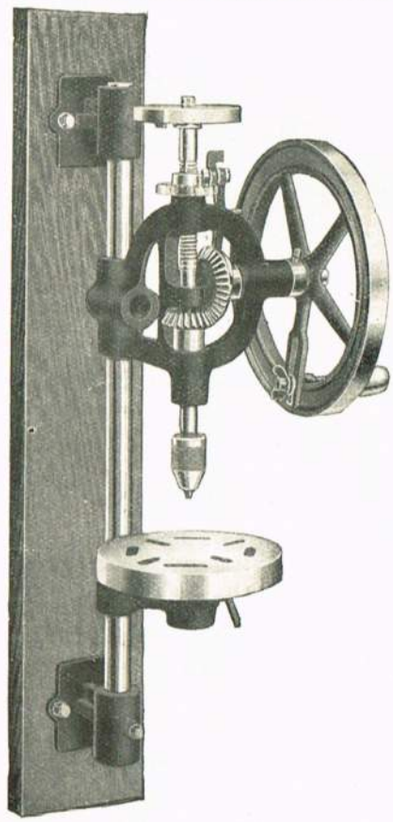


Fig. 6015. IMPROVED POST DRILLING MACHINES.

This type of machine is a very useful variation of the Wall and Bench Drilling Machines, the heads of the Nos. 3 and 4 being identical with those of the Nos. 1 and 2 respectively, It is very useful where bench space is limited, as they can be readily secured to any wall. They are also to be recommended where a permanently fixed machine is desired, as when fitted with Fast and Loose Pulleys it forms a very Compact Power Machine at a much less price than the ordinary Pillar type.

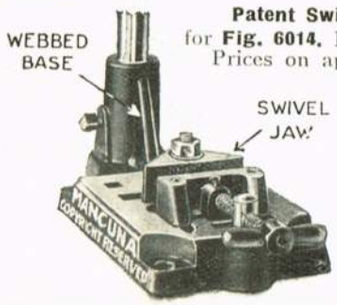
It is supplied complete with a good quality varnished Back Board as illustrated.

Both the Head and Table Bracket rise and fall on the Pillar, and are quickly clamped in position. The Table swivels in the Bracket and can be removed if desired, so that the Bracket can be swung out of the way and large objects drilled.

It can also be supplied with a Plain Spindle to take ½-in. parallel shank Drills or with Self-Centering Chuck, as illustrated, or with Morse Taper.

SPECIFICATION.

Size	Drills Holes up to	Depth of Feed	Diam. of Table	Length of Pillar	Weight	Max. distance Spindle to Table
No. 3	⅝″	2½″	7½″	33″	54 lbs.	15″
No. 4	1″	4″	12″	42″	135 lbs.	22″



Patent Swivel Jaw for **Fig. 6014.** Nos. 1 and 2. Prices on application.

Fig. 6015. PRICES.

	£	s.	d.
No. 3, with Plain Spindle for ½-in. Shank Drills	3	5	0
No. 3, with S.C. Chuck ½-in. Capacity	3	10	0
No. 3, with No. 1 Morse Taper, no Chuck	3	10	0
No. 3, Fast and Loose Pulleys extra	0	10	0
No. 4, with Plain Spindle for ½-in. Shank Drills	6	15	0
No. 4, with S.C. Chuck ¾-in. Capacity	7	10	0
No. 4, with No. 2 Morse Taper, no Chuck	7	10	0
No. 4, Fast and Loose Pulleys extra	0	15	0

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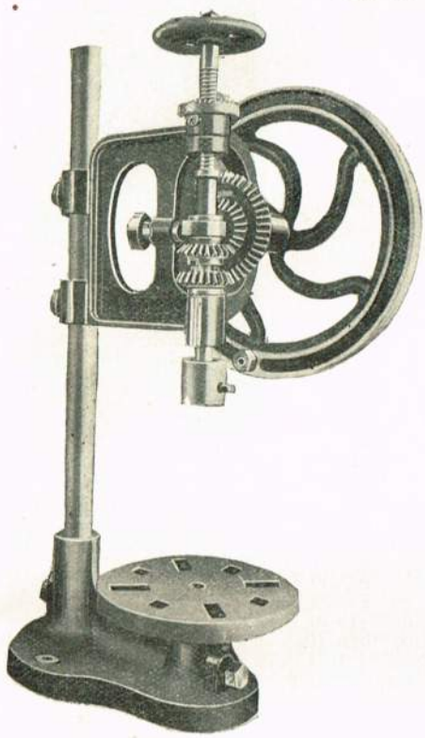
DRILLING MACHINES.

Fig. 6017. NEW DESIGN TWO-SPEED DRILLING MACHINE.

With milling attachment.



Type A.

A well-made practicable tool of British manufacture. Fitted with 2-speed machine-cut gears. Automatic and hand feed. Speeds changed by milled thumb screw. Adjustable polished top turn table. Enamelled in black and red in best finish.

Type A.

Machine complete with 3-jaw self-centreing chuck to take up to ½″.

£5 0 0.

Type C.

Machine complete with No. 1 Morse taper spindle and 3-jaw self-centreing chuck, and No. 1 Morse taper spindle.

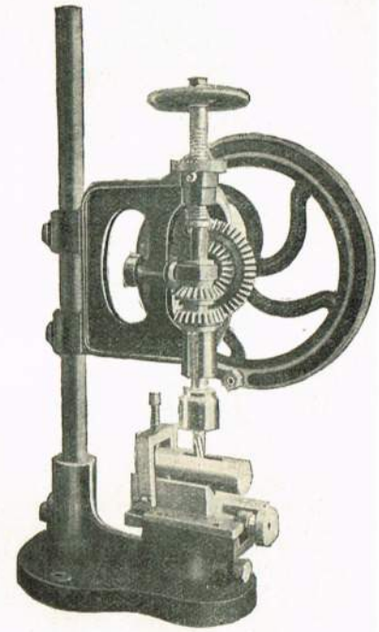
£5 5 0

Slot milling attachment, **£2 0 0.**

Set of high-speed end mills, 3/16″, ¼″, 5/16″, ⅜″.

£1 5 0.

Fast and loose pulleys, **10**/– extra.



Type B.

SPECIFICATION :

Drills holes up to ¾″. Drills to centre of 12¾″. Spindle to base, 12″. Diameter of table, 8″.
Weight, 65 lbs. Diameter of fly wheel, 13″.

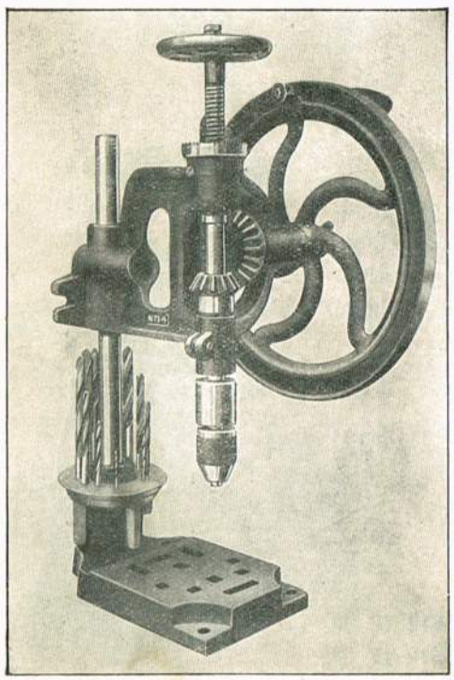


Fig. 6018.

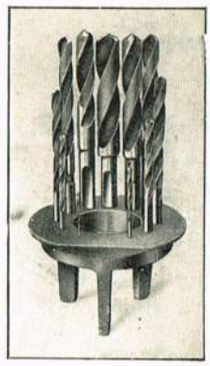


Fig. 6019.

Fig. 6019. DRILL STAND

of strong design.

The stand will hold drills 1/16″ to ½″×1/16ths together with 9/16″, ⅝″ and ¾″ twist drills with ½″ parallel shanks This stand is suitable for all pillar machines. Each hole is clearly marked with raised figures and drilled to size in solid metal.

PRICES.

Stand without drills. **4**/– each.

Stand with drills, 1/16″ to ½″×1/16ths. **8**/– each.

Stand with drills, 1/16″ to ⅝″×1/16ths, and including one ¾″ drill. **12/6** each.

Fig. 6018. DRILLING MACHINES.

PRICES AND SPECIFICATION.

Size	Drills holes up to	Drills centre of	Vertical feed	Total weight	Fast and loose pulleys	Price
No. 14	⅝″	12″	2¼″	50 lbs.	**10**/– extra	**£2 15 0**
No. 14½	⅞″	16″	4″	120 lbs.	**12**/– extra	**£5 10 0**
No. 15	1″	17″	4″	140 lbs.	**20**/– extra	**£5 15 0**

Self C. Chuck, ¾″ capacity for Nos. 14½ and 15 Machines ... **12/6** extra.

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BENCH AND WALL DRILLING MACHINES.

Fig. 6020. Nos. EJ1—5.
Price .... **£4 11 6.**

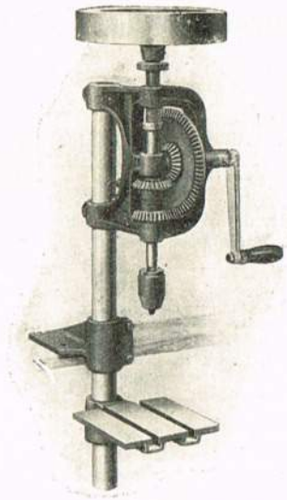

Fig. 6021. Nos. EJ6—10.
Price .... **£3 13 0.**

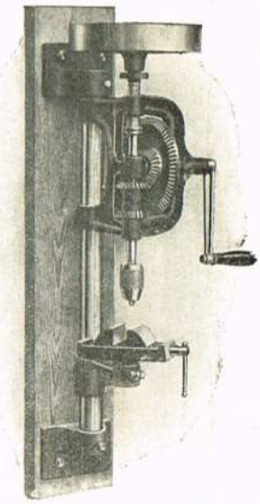

Fig. 6022. Nos. EJ11—15.
Price .... **£4 8 0.**

Two-speed. Drilling holes up to ½″. with self-centering chuck. Weight 50 lbs.

Spindle to column	4″	Chuck to table: Nos. 1 to 5	7″
Diameter of table, round or square	6″	,, ,, Nos. 6 to 10	9½″
Length of pillar—Nos. 1 to 10, 24″; Nos. 11 to 15	32″	,, ,, Nos. 11 to 15	14½″
Diameter of fly-wheel	6¾″	Chuck to bar, Nos. 1 to 5	12½″
Vice jaws open	2½″		

SPECIFICATION.

Fitted as under.	Bench machine with planed base. No.	Price	Bench machine mounted on bracket. No.	Price	Wall machine mounted on heavy board. No.	Price
Round table and vice	**EJ1**	**4 11 6**	**EJ6**	**4 7 9**	**EJ11**	**4 12 6**
Round table only	**EJ2**	**4 0 0**	**EJ7**	**3 16 3**	**EJ12**	**4 1 0**
Centre leg vice only	**EJ3**	**4 7 0**	**EJ8**	**4 3 3**	**EJ13**	**4 8 0**
Square table and vice	**EJ4**	**4 8 3**	**EJ9**	**4 4 6**	**EJ14**	**4 9 3**
Square table only	**EJ5**	**3 16 9**	**EJ10**	**3 13 0**	**EJ15**	**3 17 9**

VICE ONLY.

No. EJ1. Centre leg pattern, as illustrated **£0 12 6**

No. EJ2. Flat base, for bolting to square table **£0 12 6**

Fig. 6023. HAND POWER MACHINE.

For drilling holes up to 1¼″.

The most important feature of this machine is the improved method of gearing—two speeds are obtained by the aid of two pairs of bevel wheels only. It has adjustable crank throw for speed variations. It is self-feeding of simple yet strong design. Has large diameter feed screw. Bevels are machined from the solid, and a large ball thrust bearing is fitted to take drill thrust.

SPECIFICATIONS.

Drills up to	1¼″	Diameter of spindle	1¼″ and ⅞″
Admits in diameter	16″	Bore of spindle	see below
Spindle to table	12½″	Diameter of fly wheel	18″
Spindle to base	14″	Height to feed wheel	34″
Automatic feed of spindle	5″	Size of base	19″ × 9″
Rise and fall of table	4″	Approx. weight	232 lbs.
Diameter of table	12″		

No.

EJ20. Machine with ⅝″ bored spindle as shewn **£12 10 0**

EJ21. ,, ,, No. 3 Morse taper, will take drills up to 1¼″ **£12 17 6**

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DRILLING MACHINES.

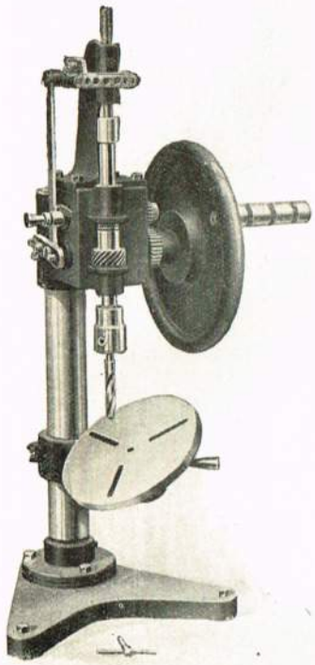

Fig. 6024.

HAND POWER BENCH DRILLING MACHINE.

For drilling holes up to 1″.

Of very substantial construction and unique design.

All gears are machine-cut from the solid, and the drive is by a pair of spiral cut gears fitted with ball thrusts. Two speeds are provided. The table can be turned round the column and also swivelled to any angle. The table—which is slotted—can be raised or lowered and locked in any position on the column. The rising arm and table are fitted with steel locking handles. The self-acting motion can be set to obtain fine or coarse cuts, as may be desired.

DIMENSIONS.

Height over all	40″
Length of column	28″
Diameter of column	3″
Diameter of spindle	1″
Diameter of hand wheel	15″
Capacity of chuck	0–½″
Greatest distance between chuck and table	12″
Greatest distance between chuck and base	17″
Distance from centre of spindle to column	6½″
Length of self-acting movement of spindle	4″
Number of speeds	2
High-speed geared up from direct	4 to 1
Drilling capacity	1″
Weight	160 lbs.

PRICE, including Chuck .... **£16 10 0.**

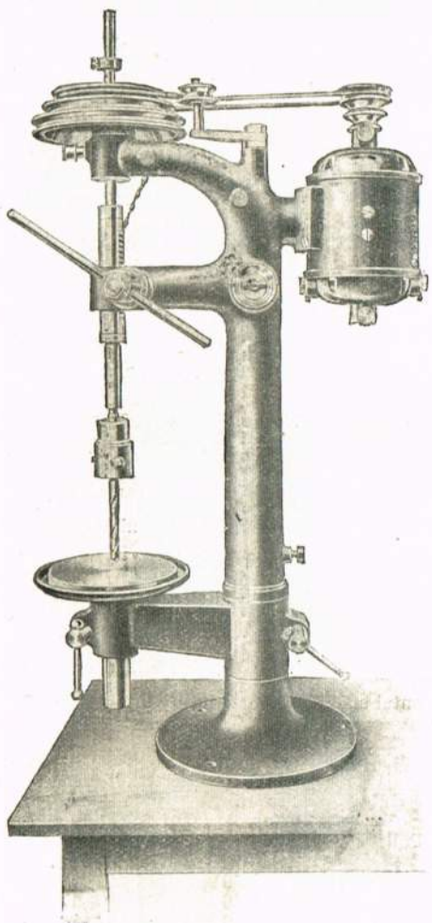

Fig. 6025.

THREE-SPEED ELECTRICALLY DRIVEN BENCH DRILLING MACHINE.

Fitted with two-jaw chuck, or can be fitted with Morse taper socket. Fitted with three-speed round belt pulleys and jockey pulley. Rise and fall table, which can be swung on one side for long work. Ball thrust on spindle. Totally enclosed motor of improved design. Also made with stand to floor. Prices upon application.

Prices shown are for 200–250 volt direct-current tools. Slight variations for other voltages and for three-phase alternating current types. Two-phase about 10% higher. Single-phase machines same price, but reduced outputs.

No.	Dia. hole at slowest speed	Max. depth of hole	Radius (thickness of material)	Speeds	Weight	Price
1	5/32″	2½″	4″	1500, 1000 and 450	77 lbs.	**£18**
2	5/16″	3¼″	5½″	1500, 900 and 500	105 lbs.	**£21**
3	⅝″	4½″	7¾″	1200, 800 and 500	160 lbs.	**£30**

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DRILLING MACHINES.

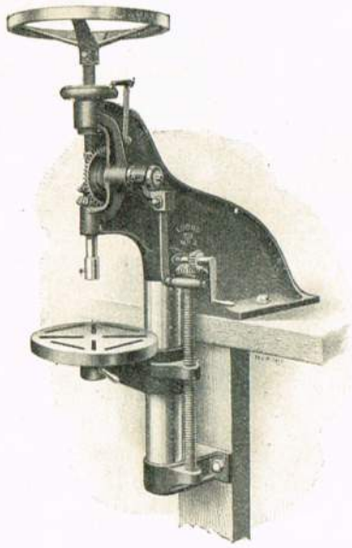

Fig. 6026. EL2 and EL2m.

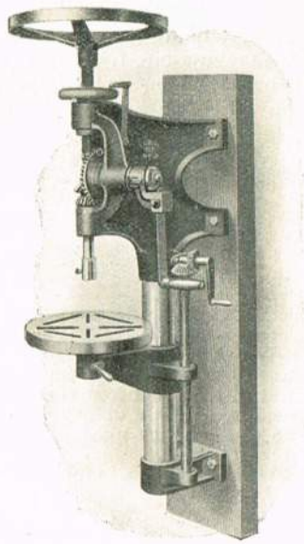

Fig. 6027. EL3 and EL3m.

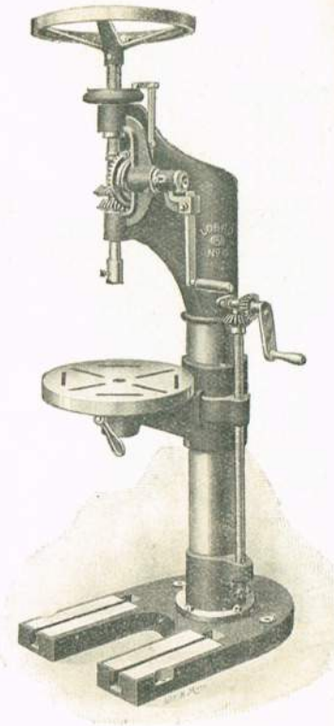

Fig. 6028. EL4 and EL4m.

An excellent range of hand-driven drilling machines for bench, wall and floor. The table is raised and lowered by accurately cut bevel gears. The self-acting feed screw is simple and of solid construction of extra large proportions, ensuring a steady feed. The table is of large diameter and fitted with quick grip clamp. The columns and spindles are ground. Two spindle speeds are provided through machine cut bevel gears. The handle is also adjustable, giving a large range of speeds.

No.	Drills up to	Admits diam.	Max. Sp'dle to Table	Sp'dle to Base	Automatic feed of Spindle	Rise & Fall of Table	Dia. of Table	Dia. of Column	Diam. of Spindle	Diam. of Fly-wheel	Height Over-all	Size of Base	Weight	PRICES. Spindle bored $\frac{5}{8}''$ as shown	PRICES. Spindle bored No. 3 morse Taper
EL2 & **EL2m**	$1\frac{1}{4}''$	16″	$15\frac{1}{2}''$	—	5″	$17\frac{1}{2}''$	13″	3″	$1\frac{1}{4}''$ & $\frac{7}{8}''$	18″	48″	—	220lbs.	**£13 10 0**	**£13 17 6**
EL3 & **EL3m**	$1\frac{1}{4}''$	16″	$15\frac{1}{2}''$	—	5″	$17\frac{1}{2}''$	13″	3″	$1\frac{1}{4}''$ & $\frac{7}{8}''$	18″	48″	—	200lbs.	**£13 10 0**	**£13 17 6**
EL4 & **EL4m**	$1\frac{1}{4}''$	16″	33″	43″	5″	30″	13″	4″	$1\frac{1}{4}''$ & $\frac{7}{8}''$	18″	64″	23×16	334lbs.	**£23 0 0**	**£23 7 6**

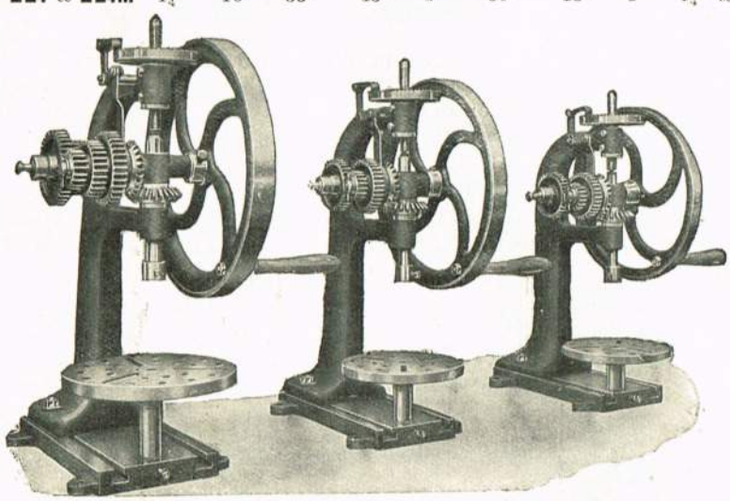

Fig. 6029. HEAVY PATTERN HAND OR POWER DRILLING MACHINES.

Drilling Machines. New and improved design. The ideal machine for engineers, coachbuilders, garages, etc., having large bearing surface. The body can be adjusted in T slots to enable long work to be manipulated over the side of the bench. Spindle holes are for $\frac{5}{8}''$ parallel shank drills. A very efficient self-feeding device is provided which can be thrown out of action immediately. The speeds are changed by pulling out the milled nut at the end of horizontal spindle thus actuating internal dogs.

Speeds	To drill holes	Admit in diam.	Admit in depth Spindle to Base	Height of Machine to Feed wheel	Spindle Feed	Table Diam.	Length of Base plate	Diam. of Fly-wheel	Approx. Weight	Price.	Extra for Pulleys	Extra for Vice	Extra if fitted with Cone Driving Pulley and top-driving Motion.
2 speed	$1\frac{1}{4}''$	16″	14″	32″	4″	12″	19″	20″	$1\frac{3}{4}$cwts.	**£14 0 0**	**£2 0 0**	**£3 5 0**	**£6 5 0**
2 speed	$1\frac{1}{2}''$	18″	15″	34″	4″	12″	21″	22″	$2\frac{1}{4}$cwts.	**£17 0 0**	**£2 0 0**	**£3 5 0**	**£7 0 0**
3 speed	$1\frac{3}{4}''$	20″	17″	38″	6″	14″	23″	24″	$3\frac{1}{4}$cwts.	**£22 0 0**	**£2 5 0**	**£3 5 0**	**£8 5 0**

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HAND AND POWER DRILLING MACHINES.

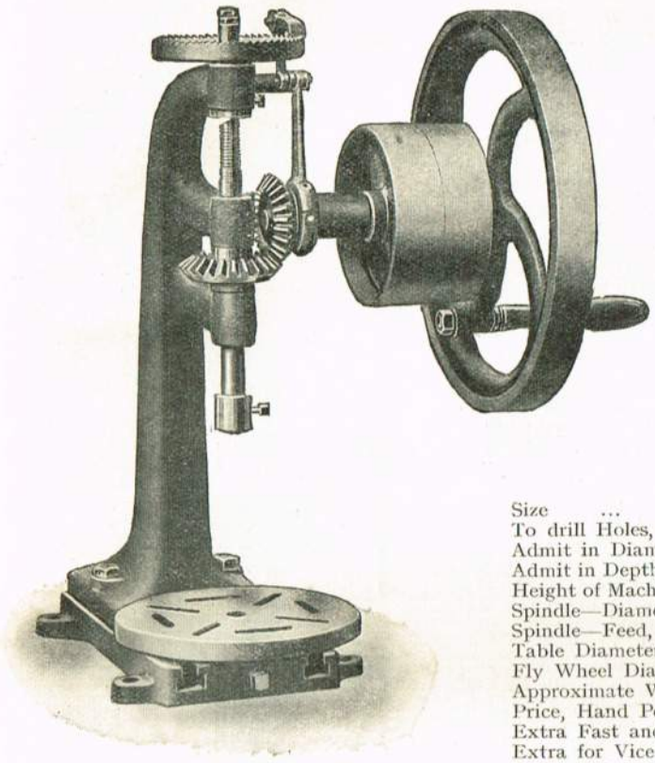

Fig. 6030. The Richmond Improved Design Bench Drilling Machine. Fitted with self-acting feed motion. Spindle thrust taken on ball thrust race. The machine body can be moved forward on baseplate, to enable large work to be drilled from floor. The Spindle takes ⅝″ parallel shank drills. The table can easily be removed from the socket and a self-centering vice placed in position. Width of jaws, 4 inches; maximum distance between jaws, 4 inches.

Prices and Specifications.

Size	17	18
To drill Holes, inch	1	⅞
Admit in Diameter, inches	14	14
Admit in Depth, Spindle to Base, inches	12	12
Height of Machine to Feed Wheel, inches	30	28
Spindle—Diameter, inches	1⅛	1⅛
Spindle—Feed, inches	4	3½
Table Diameter, inches	12	12
Fly Wheel Diameter, inches	20	17
Approximate Weight, cwts.	1½	1¼
Price, Hand Power	**£12 0 0**	**£9 0 0**
Extra Fast and Loose Pulley	**1 15 0**	**1 10 0**
Extra for Vice	**3 5 0**	**3 5 0**
Extra if fitted with Cone Driving Pulleys and Top-driving Motion	**6 5 0**	**5 10 0**

Flat Drills, 30/- per dozen. Twist Drills, as per list.

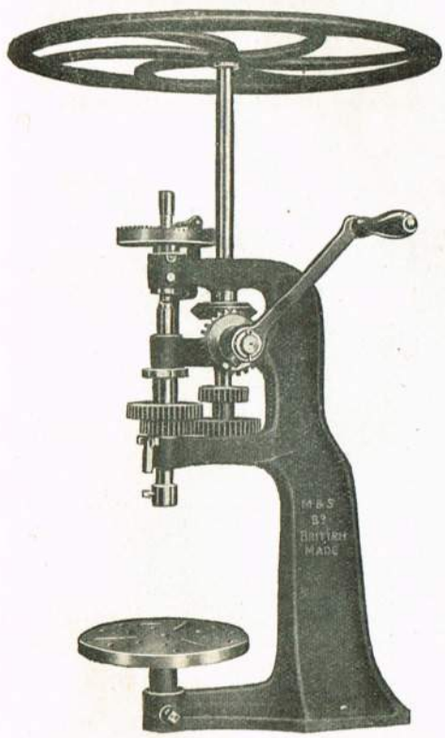

Fig. 6031. Hand and Power British Drilling Machines. Combined strength and simplicity in construction. All working parts case-hardened. Fitted with ball thrust on drill spindle.

Sizes 1a, 2, 3a, 3b, 4a and 4b are double geared with two speeds.

Sizes 1, 3 and size 4 are single geared.

Sizes 1, 1a, 3, 3a, 4 and 4a take ½ inch Shank Drills.

Sizes 2, 3b and 4b take ⅝ inch Shank Drills.

Sizes	1	1a	2
To Drill Holes, inches	¾	1	1¼
To admit in Diameter, inches	18	18	18
Height of Drill to Feed-wheel	2ft. 3in.	2ft. 3in.	3ft. 0in.
Diameter of Fly Wheel	2ft. 0in.	2ft. 3in.	2ft. 6in.
Approximate Weight, cwts.	1½	1¾	2
Price, Hand Power, with plain table	**£9 10 0**	**£12 0 0**	**£14 10 0**
Extra for Pulleys	**30/-**	**35/-**	**40/-**
Extra for Vice	**65/-**	**65/-**	**65/-**
Sizes	3	3a	3b
To Drill Holes, inches	¾	1	1¼
To admit in Diameter, inches	18	18	18
Height of Drill to Feed-wheel	2ft. 3in.	2ft. 3in.	3ft. 0in.
Diameter of Fly-wheel	2ft. 0in.	2ft. 3in.	2ft. 6in.
Approximate weight, cwts.	1½	1¾	2
Price, Table and Vice Combined	**£12 15 0**	**£15 5 0**	**£17 15 0**
Extra for Pulleys	**30/-**	**35/-**	**40/-**
Size	4	4a	4b
To drill Holes, inches	¾	1	1¼
To admit Diametr, inches	18	18	18
Height of Drill to Feed-wheel	2ft. 3in.	2ft. 3in.	3ft. 0in.
Diameter of Fly Wheel	2ft. 0in.	2ft. 3in.	2ft. 6in.
Approximate Weight, cwts.	1½	1¾	2
Price with Sliding Bar and Vice	**£11 10 0**	**£14 0 0**	**£16 10 0**
Extra for Pulleys	**30/-**	**35/-**	**40/-**

Note.—Sizes 1, 1a and 2 are fitted with plain round table. Sizes 3, 3a and 3b are fitted with round split table and vice combined. Sizes 4, 4a and 4b have adjustable sliding bars fitted with vice.

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Drilling Machines and Tyre Benders.

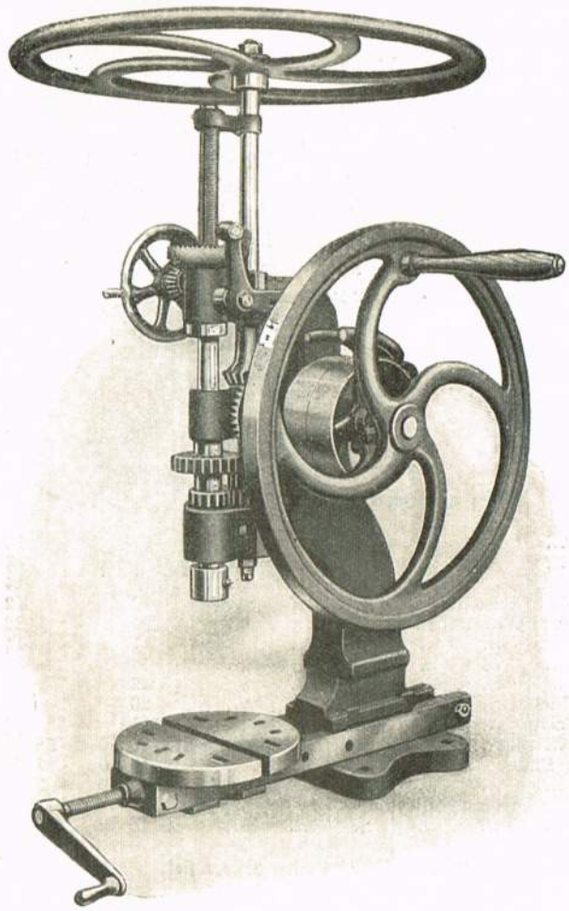

Fig. 6035.

Fig. 6035.

No. 22 "BRITON" BENCH MACHINE.

Hand and power drill, with steel gears. Self-feeding. Weight 3½ cwts.
Drills to centre of 19″.
Drills holes up to 1½″.
Diameter of spindle 1¼″.
Height, 4′ 3″.
Depth of feed, 6″.
Top fly wheel, 30″.
Driving wheel, 23″.
Price, **£14 10 0**.
If fitted with 8″ × 2″ fast and loose pulleys and strap fork.
£16 5 0.

Fig. 6036.

No. 25 PILLAR "BRITON" HAND AND POWER DRILL.

With machine-cut spur and bevel gears. Self-feeding. Weight 5½ cwts.
Drills to centre of 22″.
Drills holes up to 1½″.
Diameter of spindle, 1¼″.
Height, 6′ 5″.
Depth of feed, 5″.
Fly wheel, 30″.
Diam. of spindle bore, ½″.
As standard. Other sizes to order.
Driving wheel, 23″.
Price ... **£27 0 0.**

If fitted with fast and loose pulley, 8″ × 2″, and strap fork.
£28 15 0.

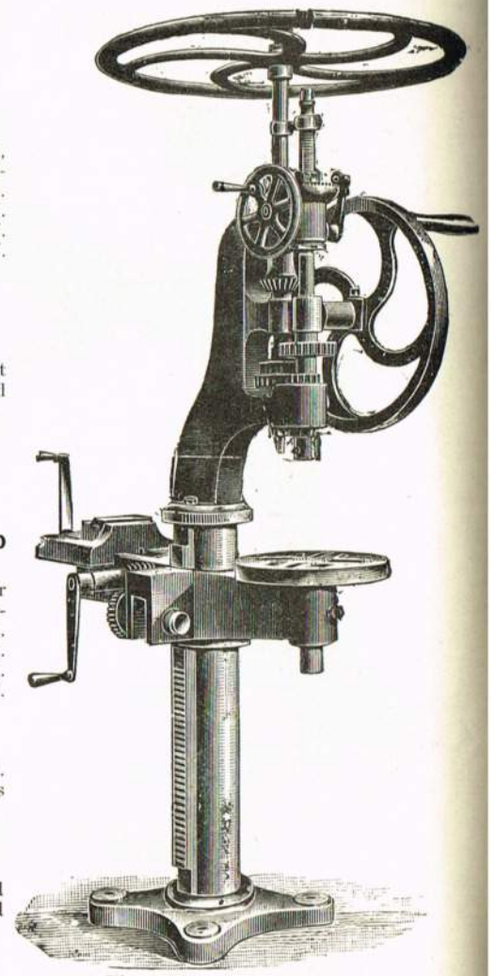

Fig. 6036.

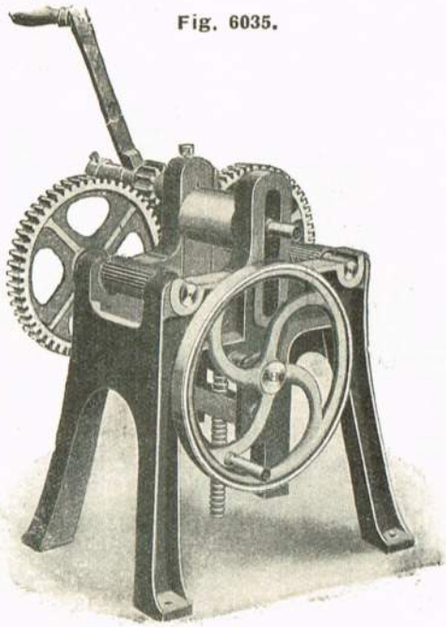

Fig. 6037. TYRE BENDERS. Model D.

With hand-wheel for raising and lowering centre roller, to apply pressure.

No.	Will bend tyres	Approx. weight	Price	Extra for pulleys
20C ...	4½″ × 1″	2¾ cwts.	£14 0 0	40/–
20CC ...	6″ × 1″	3¾ ,,	£19 0 0	50/–
20D Double geared	6½″ × 1¼″	5¼ ,,	£23 10 0	65/–

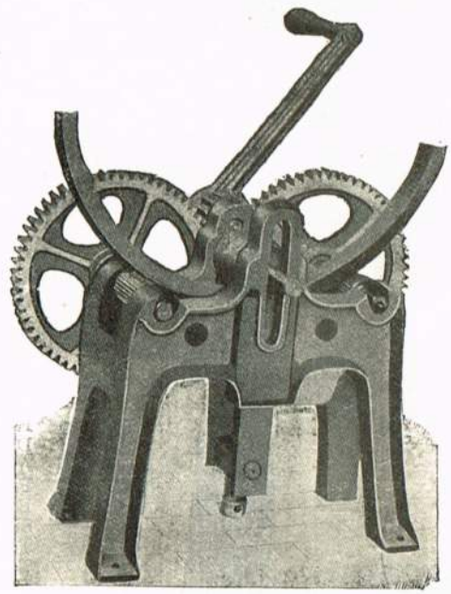

Fig. 6038. TYRE BENDERS. Model B.

Pressure applied by screw underneath.

No.	Will bend tyres	Approx. weight	Price	Extra for pulleys
20 ...	3½″ × ⅞″	1¾ cwts.	£9 10 0	35/–
20A ...	4½″ × 1″	2½ ,,	£11 10 0	40/–
20AA ...	6″ × 1″	3½ ,,	£16 10 0	50/–
20B Double geared	6½″ × 1¼″	5 ,,	£21 0 0	65/–

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GRINDERS AND CUTTING OFF MACHINES.

Fig. 6046. 2in. Capacity Twist Drill Grinder, mounted on rigid pillar. Oil cup provided. Fitted with lever arrangement supporting the drill holder in a fixed position radially, at the same time allowing about 1in. travel for moving the holder away from the wheel to facilitate inserting or removing the drill. Other adjustments are provided and the machine is correct in its grinding.

Fig. 6047. Cutting Off Machine is provided with wheelguard. The frame which holds the bars to be cut is limited in movement in both directions by adjustable stops. A depth stop is provided for cutting off a number of pieces of equal length. Also supplied with swivel holder for cutting off bars at any angle up to 45 degrees.

Fig. 6046. Twist Drill Grinder.

Fig. 6047. Cutting-off Machine.

The above are fitted with ball bearings to spindles. Ball bearing loose pulleys or plain pulleys can be fitted to all types, complete with belt shifter, thus dispensing with overhead gear. Fitted with malleable iron wheel guard.

The loose pulley on these machines is ½in. smaller in diameter than the fast pulley for relieving belt strain. The loose pulley runs on a long sleeve, thus relieving the spindle entirely of wear and belt strain.

	Grinding Machine.	Cutting-off Machine
Height to centre of spindle, inches	42½	42½
Length of spindle, inches	17	12½
Diameter of column foot, inches	15	15
Diameter of spindle in bearings, inch	⅜	¾
Diameter of fixed pulley, inches	2×1¾	2×1¾
Diameter of fast pulley, plain, inches	2½×1½	2½×1½
Diameter of loose pulley, inches	2×1½	2×1½
Size of emery wheel recommended, inches	8×1¼ recessed 5×½ bevelled	8×$\frac{1}{32}$ or $\frac{1}{16}$
Speed of spindles, R.P.M.	2400	3000
Diameter of fast pulley, B.B. and loose, inches	2⅝×1¾	2⅝×1½
Approximate weight, lbs.	136	137
Price, with plain fast and loose pulley and striking gear as illustrated	**£22 16 6**	—
As illustrated, with 8½in. overhead gear	—	**£15 6 6**
With ball bearing fast and loose pulley and striking gear, as illustrated	**£24 7 6**	—
With 8½ inch overhead gear	**£24 9 0**	—
With plain fast and loose pulley and striking gear	—	**£13 13 6**
With ball bearing fast and loose pulley and striking gear	—	**£15 4 6**

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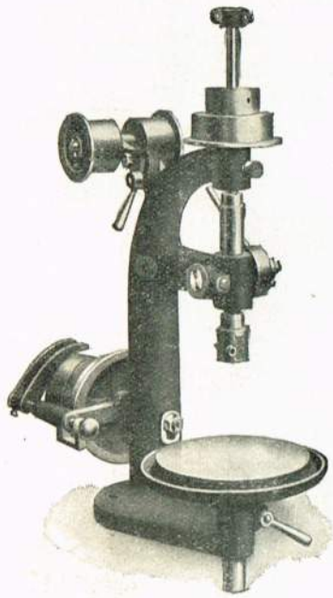
DRILLING MACHINES.



Now made with T-slots in table.

Fig. 6050. Type GA 1, 2, 3. Drilling holes up to ½″.

12″ Bench Sensitive Drilling Machines are highly popular for small repetition drilling where no great height is required between chuck and table. On such work the machines meet all ordinary requirements, whilst being light and convenient in use and inexpensive in first cost and installation.

Ample belt power is provided. The larger cone pulley is mounted on an adjustable bracket, giving ample belt adjustment and permitting the striker fork to be placed on either side for driving from either an under or over main shaft.

The spindle is accurately ground and is fitted with an efficient ball thrust bearing. The rack and pinion are cut from the solid and a large, simply adjustable balance spring is fitted for returning the spindle.

We can supply this machine with a chuck permanently fitted to the spindle, as illustrated, or with the spindle bored to fit No. 1 Morse taper shanks. Owing to the limited height we recommend the former.

SPECIFICATION AND PRICES.

Distance spindle to column	6″	Dimensions of driving pulley	4½″ × 1⅜″
Capacity of chuck fitted	½″	Speed ditto	400 r.p.m.
Feed of spindle	3½″	Speeds of drill spindle	422 and 872 r.p.m.
Maximum distance chuck to table	7″	Cone pulley belting required	71″ × 1¼″ × 1″
Machined surface of table	8″ diam.	Approximate height to top of pulleys	27″
Vertical adjustment of table	3″	Approximate weight, unpacked	76lbs.

Type GA1.	Fitted with ½″ chuck, as illustrated	**£6 7 6**
,, GA2.	As above, but fitted with No. 1 Morse taper spindle, without chuck	**£5 10 0**
,, GA3.	As above, with No. 1 Morse taper spindle, including ½″ chuck and arbor	**£6 17 6**

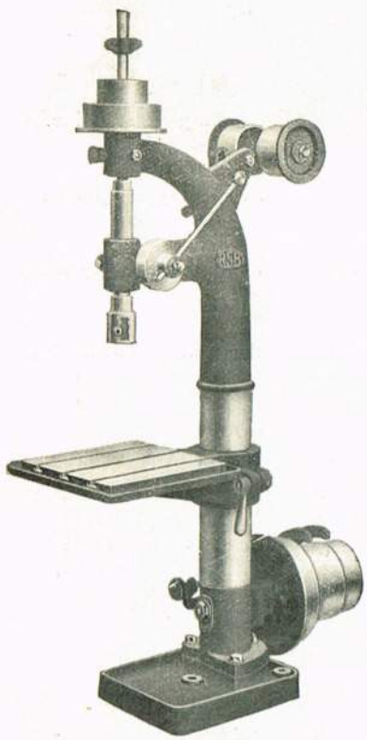


Illustration shews machine fitted with Table No. T13.

Fig. 6051. GR 3, 13 and GF 4, 14. Drilling holes up to ½″.

Bench drilling machines can be supplied with either of the two tables illustrated. Both are equally efficient on suitable work, No. T3 being especially convenient when oil or slurry is to be used on the drill. Table No. T4 is more useful on general work, the machined side face frequently obviating the use of a separate angle plate. We can also supply the machine either with a chuck fitted permanently to the spindle, or the spindle bored to take No. 1 Morse taper drills. Pulleys are of large dimensions, giving ample belt power. The driving pulleys are mounted on an adjustable bracket, providing ample belt adjustment and permitting the belt striker fork to be placed on either side. The spindle and column are accurately ground to fine limits. Rack and pinion are cut from the solid, and a large balance spring is provided for returning the spindle, which is also fitted with an efficient ball thrust washer.

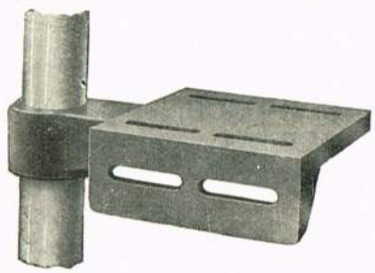


Table T. 4.

SPECIFICATION AND PRICES.

Distance spindle to column	6″
Capacity of chuck fitted	½″
Capacity when fitted with No. 1 Morse taper	9/16
Feed of spindle	3½″
Maximum distance chuck to table	11″
Machined face of table No. T3	8″ × 10″
Machined No. T4	7½″ square × 2¾″ side
Width of base	8½″
Fast and loose pulleys	4½″ × 1⅜″
Speed of loose pulleys	450 r.p.m.
Speed of drill spindle	476 and 980 r.p.m.
Height to top of pulleys	35″
Weight	90lbs.

PRICES.

Type GF3.	Machine fitted with table No. T3 and with No. 1 Morse taper spindle	**£7 0 0**
,, GF13.	Ditto, but with 0–½″ chuck, and without Morse taper spindle	**£7 17 6**
,, GF4.	Machine fitted with table No. T4 and with No. 1 Morse taper spindle	**£7 5 0**
,, GF14.	Ditto, but with 0–½″ chuck and without Morse taper spindle	**£8 2 6**

0–½″ 2-jaw drill chuck, with No. 1 Morse taper arbor, **£1 7 0** each.

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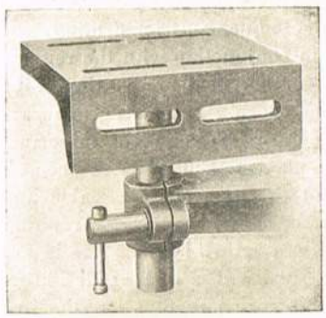
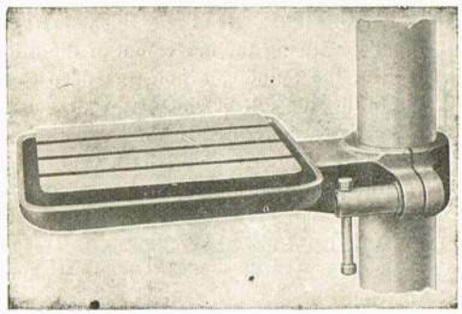
DRILLING MACHINES.

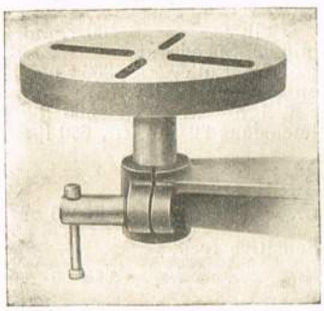
Type GE 12-inch SENSITIVE HIGH SPEED DRILLING MACHINE.
For drilling holes up to ½ inch.



No. T5.
Face 7½″ square; side 2¾″ deep; slots ½″.



No. T3.
Machined face 8″ × 10″: slots ½″ wide.



No. T2.
9½″ diam. × 1″ deep; slots ½″ × 3″; leg 1⅜″ × 2½″.

Fig. 6052. GE Sensitive Pillar Drilling Machines are made throughout on a highly specialised plant and of the finest materials. During manufacture all parts are subjected to a rigid inspection, and after assembly each machine is tested under power and finally inspected before leaving the works. We have, therefore, every confidence in recommending these machines to all who require an accurate and well-finished machine at a reasonable cost.

In the **Fig. 6053 GE Machine** the large cone pulley and loose pulley are mounted on an adjustable bracket, providing ample belt adjustment. The spindle is accurately ground and is fitted with an efficient ball thrust washer. The rack and pinion teeth are cut from the solid and a large balance spring is fitted for returning the spindle. The jockey or idler pulleys are of generous proportions and are mounted on an easily adjustable bracket. Two driving keys are fitted, placed diametrically opposite, thus providing a sensitive "feel" under heavy cuts and perfectly balancing the spindle.

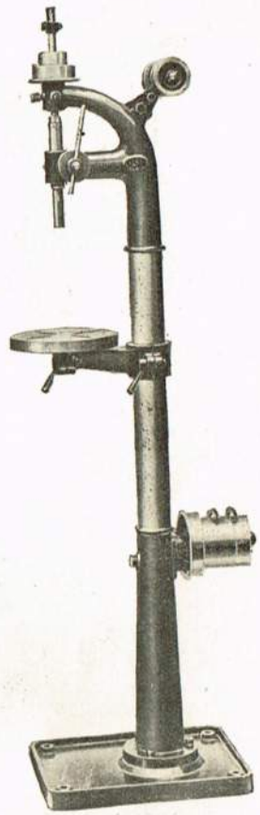


Illustration of Machine
Fig. 6052. Type GE2.

SPECIFICATION AND PRICES.

Spindle to column 6″; stroke of spindle 3½″; chuck to table 24″; chuck to base 48″; width of base 16″; driving pulley 4½″ × 1⅜″; revolutions of drill spindle 476 and 980 r.p.m.; revolutions of driving pulley 450 r.p.m.; chuck capacity 0–½″; capacity of Morse taper No. 1 = 9/16; height 5ft. 4in.; weight 170 lbs.

Type		Price fitted with No. 1 Morse taper spindle.
GE1	with T1 table (see next page)	**£9 10 0**
GE2	,, T2 as above	**£9 15 0**
GE3	,, T3 ,,	**£9 5 0**
GE4	,, T4 ,, (see previous page)	**£9 10 0**
GE5	,, T5 table	**£10 0 0**

		Price each fitted with 0–½″ 2-jaw chuck but no Morse taper.
GE11	with table fitted corresponding with GE1	**£10 7 6**
GE12	,, ,, ,, ,, GE2	**£10 12 6**
GE13	,, ,, ,, ,, GE3	**£10 2 6**
GE14	,, ,, ,, ,, GE4	**£10 7 6**
GE15	,, ,, ,, ,, GE5	**£10 17 6**

Chucks 0–½″. 2-jaw drill chuck, with No. 1 Morse taper arbor, **£1 7 0** each.

Fig. 6053. GB 12-inch SENSITIVE HIGH-SPEED DRILLING MACHINE.
For drilling holes up to ½″.

Manufactured on the same high-grade lines as GE type, but without rise and fall table but fitted with table trays.

SPECIFICATIONS.

Capacity of chuck fitted	⅜″	Dimensions of driving pulley	4½″ × 1⅜″
Largest drill with No. 1 Morse taper	9/16″	Speed of ditto	450 r.p.m.
Admit of diameter	12″	Speed of drill spindle	476 and 980 r.p.m.
Feed of spindle	3½″	Cone pulley belting required	71″ × 1¼″ or 1″
Maximum distance chuck to table	7″	Approx. height to top of pulleys	61″
Machined surface of table	8″ diam.	Approx. weight	188 lbs.
Vertical adjustment of table	3″		

PRICES.

Type		
GB1	Machine as illustrated, with 0–⅜″ chuck	**£9 2 6**
GB2	Machine with No. 1 Morse taper spindle (no chuck)	**£8 5 0**
GB3	Machine with ditto, and including chuck and arbor	**£9 12 6**

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DRILLING MACHINES.

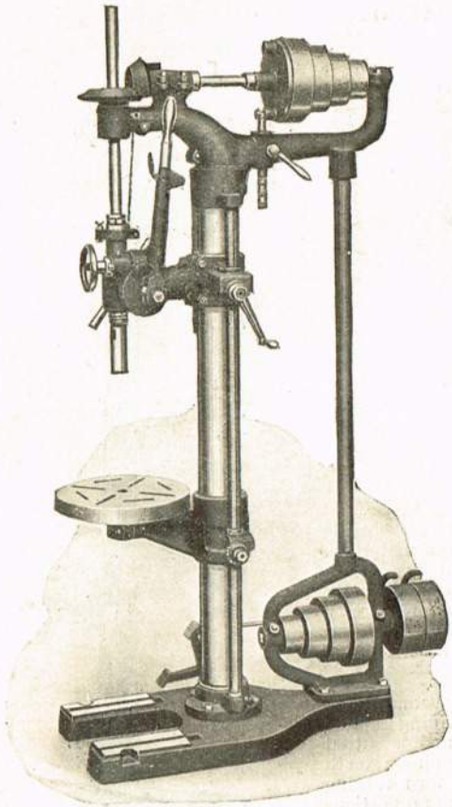


Fig. 6056.

A4. 16″ PILLAR DRILLING MACHINE for Drilling holes up to 1¼″.

With Sliding Head and Back Gears, and sensitive adjustment for drilling.

By utilising the movement of the Sliding Head in conjunction with the regular feed of the Spindle, a hole 14″ deep can be drilled or bored at one setting, thus obtaining the full benefit of the Planed and T slotted Base. The Back Gears are correctly proportioned to the Cone Pulleys, giving eight Spindle Speeds in correct geometrical progression over a very large range. The Cone Pulley has a deep oil retaining web to ensure the efficient lubrication of the gears. The Table and Sliding Head are independently adjustable by means of a heavy screw running the full length of the column. Gears are all cut from solid blanks. Bevels are accurately planed. The Spindle is balanced and is fitted with a large Ball Thrust Bearing. Lay Shafts run in anti-friction metal bearings of generous length. All gears are protected.

Specifications.

Distance Spindle to Column	8″	Fast and Loose Pulleys ...	7″ dia. × 2⅜″
Feed of Spindle	6¾″	Cone Pulleys ...	8″, 6⅝″, 5¼″, 3⅝″ × 2⅛″
Morse Taper Hole in Spindle	No. 3	Recommended Speed of Fast Pulley ...	400 r.p.m.
Diameter of Spindle in Quill	1¼″	Range of Spindle Speeds at Fast Pulley	13/366 r.p.m.
Vertical Adjustment of Head	7″	Height to top of Cone Pulley ...	73″
Diameter of Table	13″	Approximate Weight	500 lbs.
Max. distance Spindle to Table	31″	Shipping Dimensions	29 cub. ft., 650 lbs.
ditto. Spindle to Base	46″		
Number of Spindle Speeds...	8		

Prices.

Type	A41—as above, with **Lever feed only**	**£26 0 0**
,,	A4W—as above, but with Lever and Worm Sensitive feed, as shewn	**£28 0 0**
,,	¾″ 2 Jaw Chuck and Arbor to fit Morse Taper Chuck ...	**£1 15 0**

Fig. 6057. Type G.R. 12″ SENSITIVE HIGH-SPEED BENCH DRILLING MACHINE for Drilling holes up to ½″.

Pulleys are of large dimensions, giving ample belt power. The large Cone Pulley is mounted on an adjustable bracket, providing ample belt adjustment and permitting the striker fork to be placed on either side. The Spindle and Column are accurately ground to close limits. Idler Pulleys are of large diameter and are mounted on an easily and positively adjustable bracket. The Rack and Pinion Teeth are accurately cut from the solid and a large Balance Spring is provided for returning the Spindle, which is also fitted with an efficient Ball Thrust Washer. Two driving keys are fitted, ensuring a perfectly balanced spindle and freedom of movement.

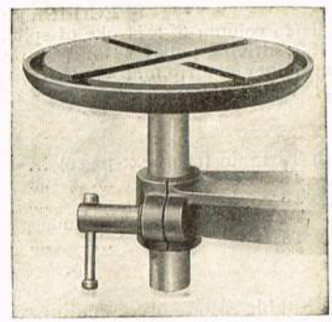


Table No. T1.

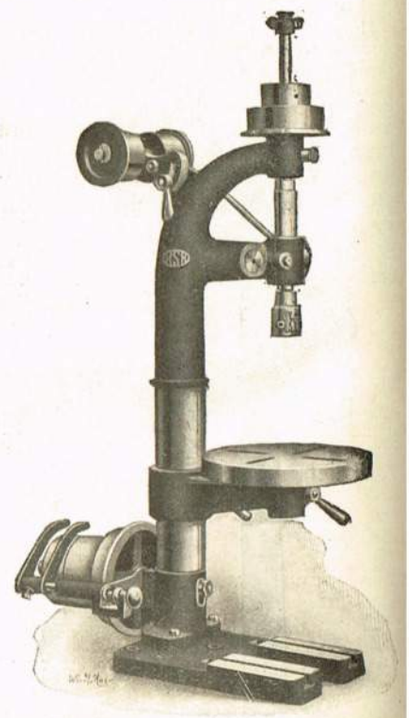
Specifications.

Distance Spindle to Column ...	6″	Width of Base	8½″
Capacity of Chuck when fitted ...	½″	Height to top of Pulleys	35″
Capacity when fitted No. 1 Morse Taper	9/16″	Fast and Loose Pulleys ...	4½″ × 1⅜″
Feed of Spindle	3½″	Speed of ditto.	450 r.p.m.
Maximum distance Chuck to Table	10½″	Speed of Drill Spindle ...	476 & 980 r.p.m.
,, ,, Chuck to Base	19″	Weight	100 lbs.

Prices.

Type		
GR1 Machine fitted with Table No. T1 and No. 1 Morse Taper Spindle ...		**£7 15 0**
GR11 ditto.	but with 0–½″ Chuck and without Morse Spindle ...	**£8 12 6**
GR2 Machine fitted with Table No. T2 and No. 1 Morse Taper Spindle ...		**£8 0 0**
GR12 ditto.	but with 0–½″ Chuck and without Morse Spindle ...	**£8 17 6**
GR5 Machine fitted with Table No. T5 and No. 1 Morse Taper Spindle ...		**£8 5 0**
GR15 ditto.	but with 0–½″ Chuck and without Morse Spindle ...	**£9 2 6**

CHUCKS. 0–½″ 2 jaw Drill Chuck, with No. 1 Morse Taper Arbor, **£1 7 0** each.



Shewing Table No. T2.
9½″ dia. x 1″ deep, Slots ½″ x 3″
Central leg 1⅜″ dia.

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DRILLING MACHINES.

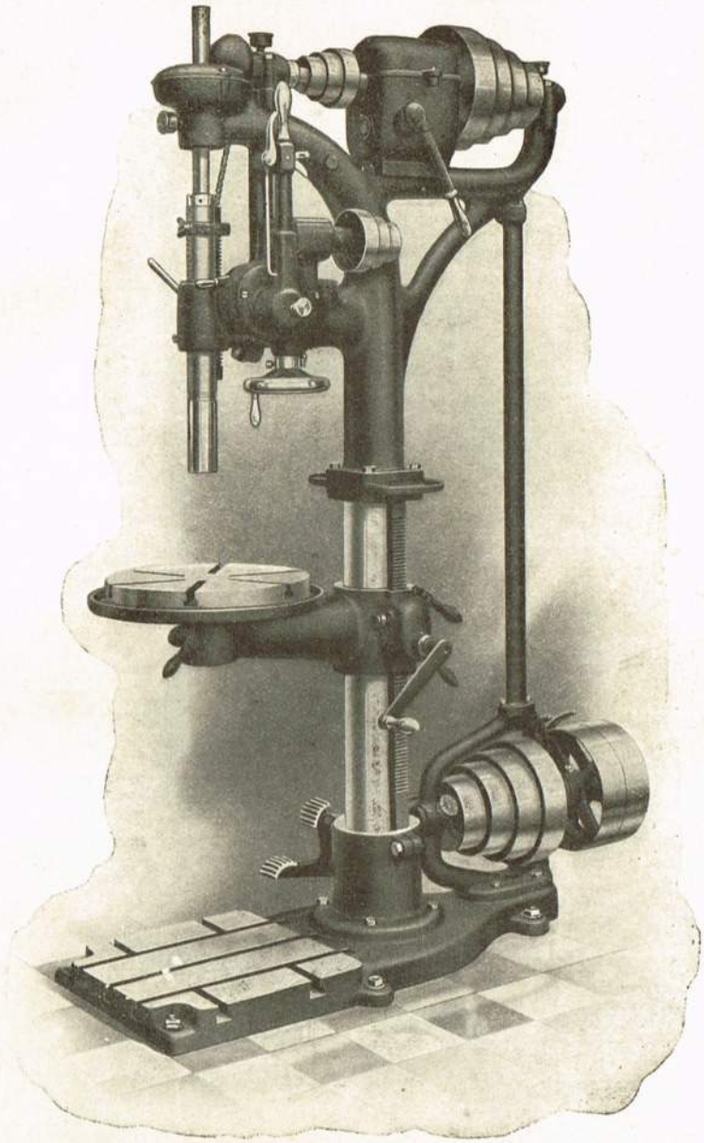

Fig. 6058. THE "DUNEDIN" 27" HIGH-SPEED PRECISION DRILLING MACHINE.

These machines are well constructed, made from high-grade materials, fitted with machine cut bevel gears, ball bearings, spindle end thrust, well balanced, and constructed to stand heavy wear. The table can be swung round the column when work is to be done on the base.

Size	1	2	3	4
Will take drills diameter, inches	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{5}{8}$	$1\frac{5}{8}$
Distance centre spindle to column, inches	$13\frac{3}{4}$	$13\frac{3}{4}$	$13\frac{3}{4}$	$13\frac{3}{4}$
Height of machine, feet and inches	6′ 6″	6′ 6″	6′ 6″	6′ 6″
Diameter of spindle, inches	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{3}{8}$
Vertical traverse of spindle, inches	$8\frac{3}{4}$	$8\frac{3}{4}$	$8\frac{3}{4}$	$8\frac{3}{4}$
Spindle fitted Morse taper No.	3	3	4	4
Diameter of table, inches	$15\frac{3}{4}$	$15\frac{3}{4}$	$15\frac{3}{4}$	$15\frac{3}{4}$
Rise and fall of table, inches	$16\frac{3}{4}$	$16\frac{3}{4}$	$16\frac{3}{4}$	$16\frac{3}{4}$
Greatest distance between spindle and table, inches	$23\frac{1}{2}$	$23\frac{1}{2}$	$23\frac{1}{2}$	$23\frac{1}{2}$
Greatest distance between spindle and base plate, inches	$40\frac{1}{2}$	$40\frac{1}{2}$	$40\frac{1}{2}$	$40\frac{1}{2}$
Diameter of column, inches	$5\frac{3}{8}$	$5\frac{3}{8}$	$5\frac{3}{8}$	$5\frac{3}{8}$
Diameter of fast and loose pulleys, inches	$10\frac{7}{8}$	$10\frac{7}{8}$	$10\frac{7}{8}$	$10\frac{7}{8}$
Diameter of cone pulleys, inches	$5\frac{7}{8} \times 7\frac{1}{2} \times 9\frac{1}{8} \times 10\frac{5}{8}$			
Width of steps, inches	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$
Revolutions per minute of fast and loose pulleys	370	370	370	370
Weight of machine, lbs., approximate	925	970	945	1000

No. 1. Feed is by worm and worm wheel, and the spindle can be raised or lowered by lever and hand wheel.
No. 2. Same construction as No. 1, but it is fitted with positive automatic feed and self-acting automatic stop.
No. 3. Same as No. 1, but furnished with enclosed back gears for 8 speeds.
No. 4. Combination of Nos. 1, 2, and 3, embracing all their features, enclosed gears, positive automatic feed, and self-acting automatic stop.

Price ... No. 4 Machine ... **£35 14 0.**

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DRILLING MACHINES.

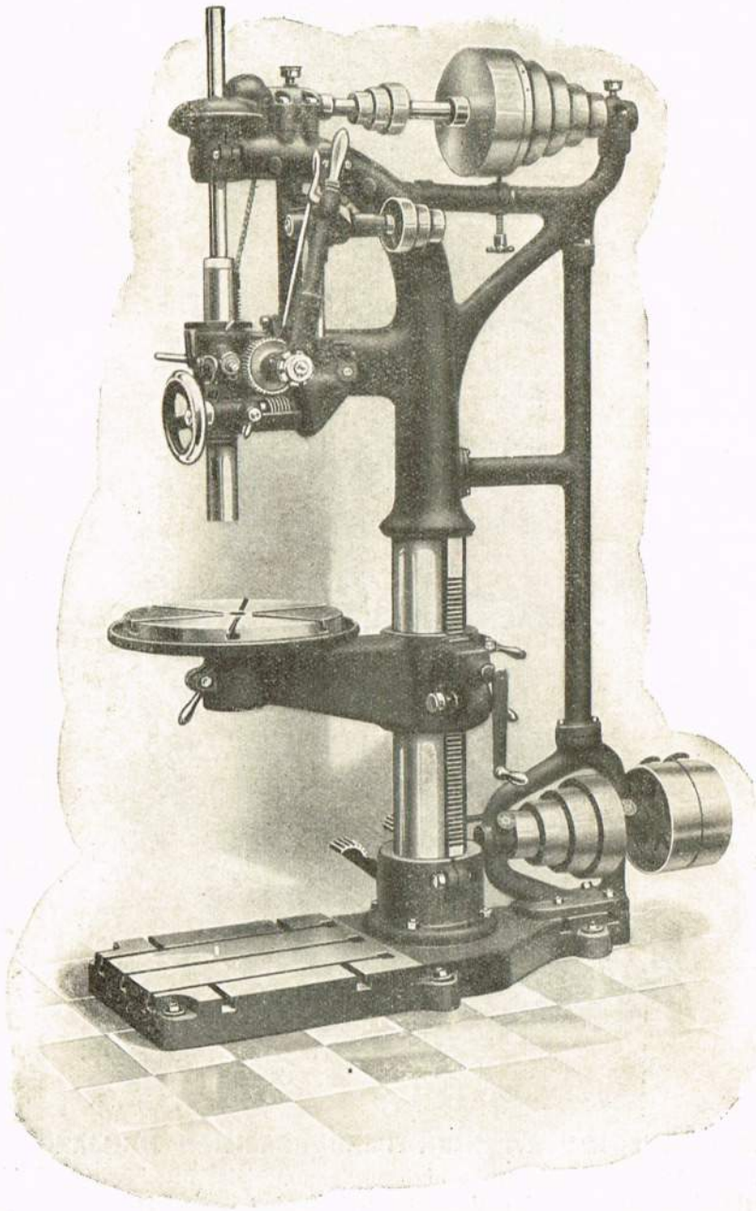

Fig. 6059. THE "AUCKLAND" 31″ HIGH-SPEED DRILLING MACHINE.

For 2″ No. 4 Morse Taper Drills.

This drilling machine comprises all the latest improvements, fitted with ball bearings to take end thrust of drill spindle. Distance centre of spindle to column, $15\frac{3}{4}''$. Height of machine, 6′ 9″. Diameter of spindle bearing, $1\frac{1}{2}''$. Vertical traverse of spindle, $8\frac{7}{8}''$. No. 4 Morse taper spindle. Diameter of table, $17\frac{1}{2}''$. Rise and fall of table, $17\frac{1}{4}''$. Greatest distance between spindle and table, $23\frac{1}{2}''$. Greatest distance between spindle and base plate, $41\frac{1}{2}''$. Diameter of column, $6\frac{3}{8}''$. Diameter and width of F. and L. pulley, $10'' \times 3\frac{1}{8}''$. Diameter of cone pulleys, $9'' \times 7\frac{1}{4}'' \times 5\frac{5}{8}'' \times 4''$. Width of steps, $2\frac{3}{8}''$. R.P.M. of F. and L. pulleys, 330. Approximate weight of machines: No. 1, 1,250 lbs.; No. 2, 1,320 lbs.; No. 3, 1,340 lbs.; No. 4, 1,360 lbs.

No. 1. Feed is by worm and worm wheel, and spindle can be raised or lowered by lever and hand wheel.

No. 2. Same construction as No. 1, but fitted with positive automatic feed and self-acting automatic stop.

No. 3. Same as No. 1, but fitted with 8 speed back gears inside cone.

No. 4. Combination of Nos. 1, 2, and 3. Equipped with back gears, positive automatic feed, and self-acting automatic stop.

Price No. 4 Machine ... ... **£42 12s 0d.**

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DRILLING MACHINES.

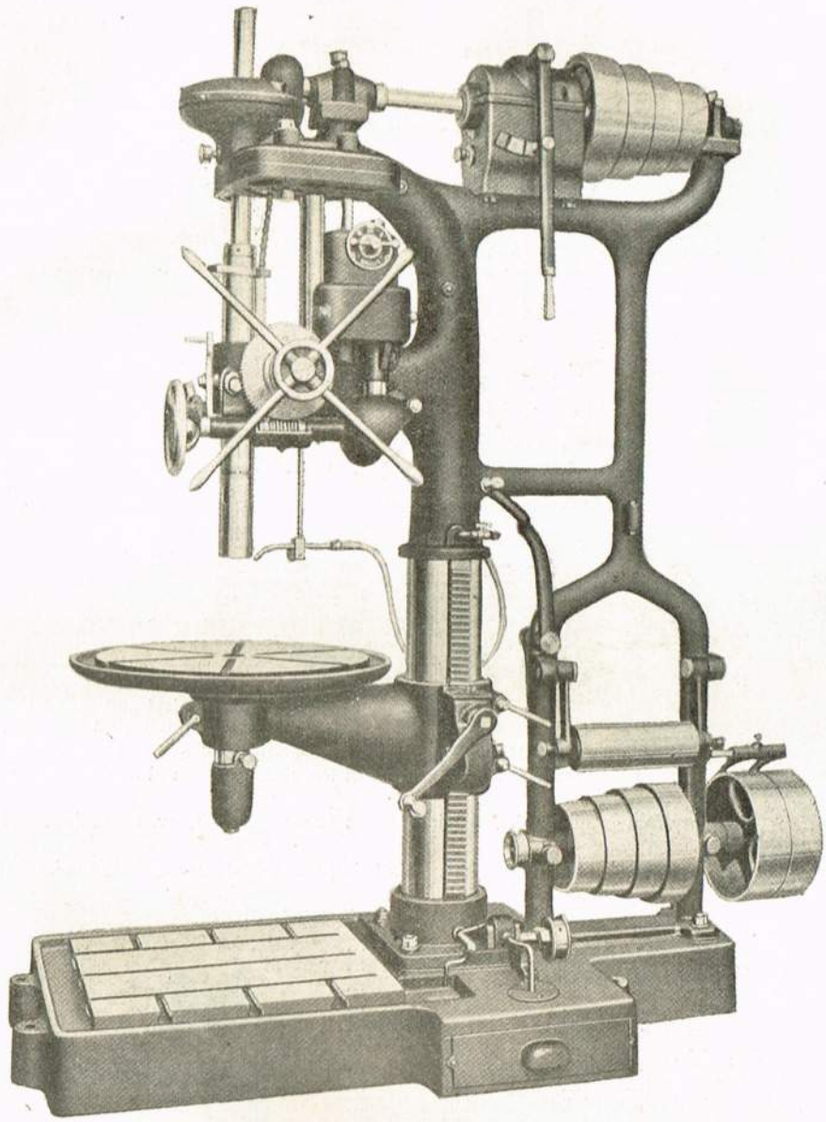

Fig. 6060. The "Brighton" 32″ High-Speed Precision Drilling Machine.

For drills $2\frac{3}{8}''$ diameter. Fitted with ball bearing spindle thrust of powerful design, constructed of finest materials, carefully machined and suitable for heavy and rapid work. The gears, straight and bevel, are all machined from the solid and run quietly. The 4-speed cone pulley bearings are supported by a forked column, thus giving great rigidity and reducing vibration. A lazy pulley is also provided to take up slack belt. The table can be swung out of the way to take work fitted to the base. Fitted with an efficient automatic lubricating system from an oil sump in the base. The feed pinion is driven automatically by means of spur pinion or hand wheel in connection with worm and worm wheel or cross handle. The Machine has a range of 8 speeds driven by a cone belt drive which can be doubled through gear box mounted on head of yoke column. The spindle is provided with a positive automatic feed, self-acting stop.

Specification.

For drills of diameter		$2\frac{3}{8}''$
Distance centre of spindle to column		$15\frac{3}{4}''$
Diameter of spindle in sleeve		$2''$
Vertical traverse of spindle		$10\frac{1}{4}''$
Spindle fitted for Morse taper	No.	5
Diameter of table		$23\frac{1}{2}''$
Greatest distance between spindle and table		$21\frac{1}{2}''$
Greatest distance between spindle and base plate ...		$39\frac{1}{2}''$
Diameter of column		$7''$
Diameter and width of fast and loose pulleys... ...		$12\frac{5}{8}'' \times 3\frac{3}{8}''$
Revolutions of same per minute		300
Width of steps on cone pulley		$3''$
Horse power required		5 HP
Weight, net ... ...approximately,	lbs.	2450

Price ... ... **£74 8 0.**

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DRILLING MACHINES.

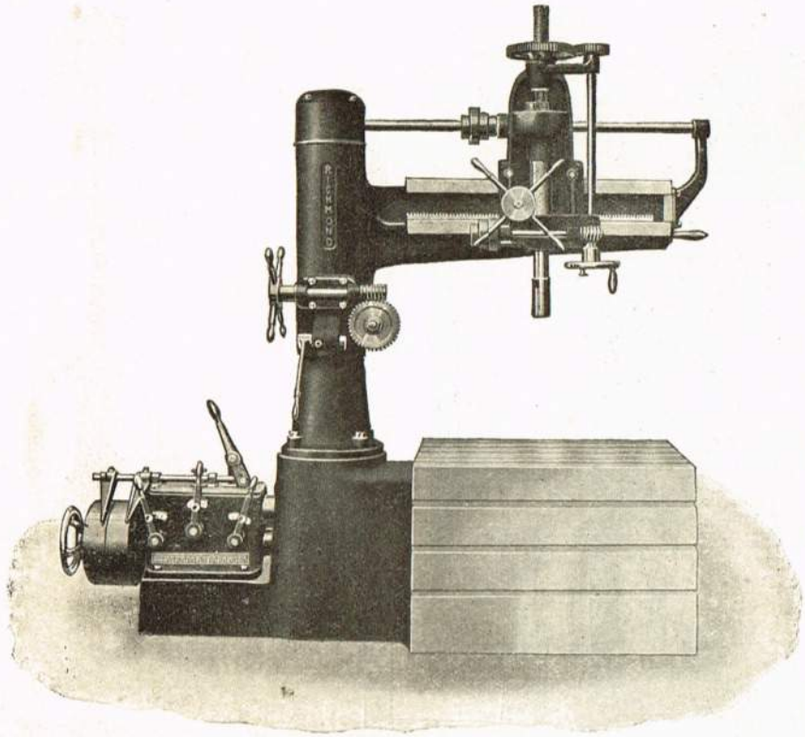

Fig. 6061. RADIAL DRILLING MACHINES.

GENERAL CONSTRUCTION.

Spindle.—Large diameter Steel Spindle, accurately ground into long Socket and provided with Check Nuts for adjusting any wear. **Automatic** and **Hand Feeds.** Spindle Thrust taken on **Ball Bearings.**

Spindle Head traverses along the **Arm** by means of rack and pinion with hand wheel.

Arm.—Specially designed for **rigidity** with large bearing surfaces. Will revolve through a complete circle. **Rises and falls** on Pillar by rack and pinion, worm and wheel.

Pillar.—Large diameter and accurately ground into the Arm.

Bed.—Accurately planed, and has **T** slots on top and side planed out of the solid. Special attention is called to the design of Bed ; as shown on illustration, an Extension is provided which is actually part of the Bed, to carry the Driving Head, or Gear Box, thus forming an extra firm foundation and ensuring true alignment and increased rigidity. Machines can be supplied with either **high Bed** or **low Base** with **loose Box Bed.**

Driving Head.—Cones are of large diameter with wide belt surface and the Double Gearing is accurately machine-cut.

Gear Box.—This style of drive is advocated as more modern practice and no Countershaft is required with same. Gear Box is extremely simple in use and is designed for easy operation. The Gears are in **special steel** and speed changes are obtained through Steel Clutches and Levers.

Tapping Motion —This is of original design, and the **Clutch Reverse** is an expecially efficient arrangement the hardened steel clutch being mounted on **phosphor-bronze bearing,** thus ensuring constant engagement of the clutch teeth and obviating any possibility of disconnection whilst the machine is working.

Gearing throughout is machine-cut from solid blanks. **Spiral Gears** ensure smooth, even running, and eliminate jar in Spindle. Driving Bevels are in special steel.

Lubrication.—Ample provision is made for oiling all bearings, this being recognised as one of the chief factors in obtaining complete satisfaction from the machine.

PRICES AND SPECIFICATIONS.

	No. 0	No. 0A	No. 1	No. 2
Maximum radius	3′ 0″	3′ 6″	3′ 6″	4′ 0″
Minimum radius	1′ 4″	1′ 4″	1′ 4″	1′ 4″
Pillar—Diameter	7″	7″	7½″	7½″
Arm—rise and fall on pillar	8″	8″	10″	10″
Spindle—Diameter	2″	2″	2¼″	2¼″
Spindle Socket—Diameter— Plain Radial	3¼″	3¼″	3¼″	3¼″
Tapping Radial	3½″	3½″	3½″	3½″
Maximum distance, Spindle to High Bed—Plain Radial.	30″	30″	33″	33″
Tapping Radial	29″	29″	32″	32″
Minimum distance, Spindle to High Bed—Plain Radial.	12″	12″	13″	13″
Tapping Radial	11″	11″	12″	12″
Maximum distance, Spindle to Low Base—Plain Radial.	48″	48″	49″	49″
Tapping Radial	47″	47″	48″	48″
Spindle Bore, Morse taper	No. 4	No. 4	No. 4	No. 4
Spindle Feed	10″	10″	10″	10″
Spindle Speeds with Cone drive	18—32—54—118—200—338		18—32—54—118—200—338	
,, with Gear-box drive	32—48—61—92—104—156—200—300		32—48—61—92—104—156—200—300	
Driving Cones, Number of Speeds	3	3	3	3
,, Largest diameter and width	11″×3¼″	11″×3¼″	11″×3¼″	11″×3¼″
Pulley on Countershaft	12″×3″×200 r.p.m.	12″×3″×200 r.p.m.	12″×3″×200 r.p.m.	12″×3″×200 r.p.m.
Size of Base, working surface	33″×27″	39″×27″	37″×30″	43″×30″
Floor Space, over all	75″×28″	81″×28″	94″×31″	100″×31″
Approximate weight	28 cwts.	30 cwts.	32 cwts.	35 cwts.
Prices—				
Plain Radial, with Screw-Feed to Spindle and Cone-drive	**£95 0 0**	**£100 0 0**	**£120 0 0**	**£140 0 0**
Extra, with complete Tapping Motion and Clutch Reverse, Balanced Spindle and Quick Return, with Ball Thrust to Spindle	**£20 0 0**	**£20 0 0**	**£20 0 0**	**£20 0 0**
Extra, with Geared-Feeds to Spindle	**£5 0 0**	**£5 0 0**	**£5 0 0**	**£5 0 0**
Extra, with Gear-Box and Single Pulley drive, as illustrated	**£15 0 0**	**£15 0 0**	**£15 0 0**	**£15 0 0**
Extra with Low Base and Loose Box Bed, 20″×20″	**£15 0 0**	**£15 0 0**	**£15 0 0**	**£15 0 0**

Illustrations, Specifications and Prices are subject to alteration.

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LATHES AND FOOT MOTORS.

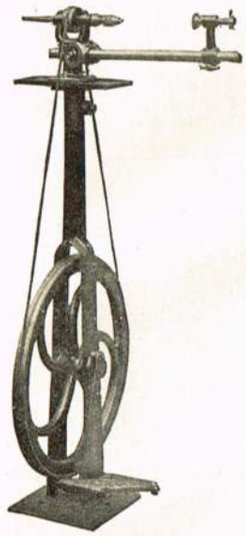


Fig. 6039. COMBINATION VERTICAL DRILLER.

Polishing and Grinding Head, with self-contained Stand and Foot Motor. Meets the demand for a long felt want—a cheap vertical driller.

It can also be used for polishing, grinding, etc. The time in changing from one position to the other being about 2 min. Bearings are adjustable and fitted for lubrication, and fibre washer takes the thrust. The cast iron tray fitted forms a convenient rest for tools and drills in use. The stand is extremely rigid having large base, and is provided with renewable phosphor bronze bushes for flywheel which is balanced to come to correct position for starting. Powerful treadle motion is fitted. The whole is nicely finished in red and black, and all bright parts polished.

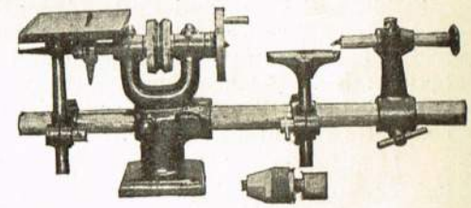
Total Height	4′ 8″.
Drills to centre of	5″
Capacity of Chuck	0″—¼″
Belt supplied	¼″ round.
Approximate Weight	78 lbs.

PRICE, each, as above	**£4 2 6**
,, ,, fitted lever feed to tailstock	**£4 5 6**

Fig. 6040. Universal Head Combining Drilled Spindle to take Face Plate or Chuck.

Tool Rest. Table can be removed, thus allowing abrasive wheel to be fitted in place of Saw.

Height of Spindle, 5½″. Dia. of Spindle, ½″. Length of Spindle, 8¼″. Length of Bed, 18″. Dia. of Bed, 15/16″. Dia. of Pulley, 2¼″. Face of Pulley, 1″. Abrasive Wheel taken, 4″ x ½″. Swing over Bed, 4″ dia. Chuck capacity, ¼″. Dia. of Saw, 3″. Weight, 17 lb. Price, **48/-** each.



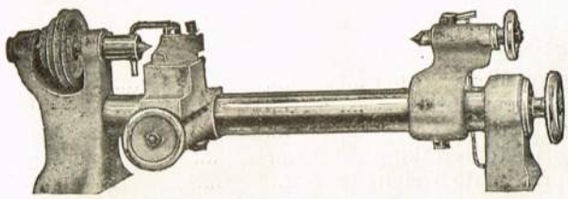


Fig. 6041. Wade Lathe, will turn up to 4″ diameter, 12″ long. 3-Speed Cone Pulley. Slide Rest. Price **£2 10 0.**

Fig. 6042. Wade Lathe, with screw-cutting attachment, will cut threads from 8 to 40 T.P.I. without compound gearing. Price **£4 10 0.**

Accessories. Set of 4 Lathe Tools, **3/6.** Face Plate, **6/9.** Countershaft, **17/6.** Wood Bend, **25/-.** 2½″ Universal Chuck, with back casting, **33/-.**

Fig. 6043. Foot Motor for Round Belt.

Dia. of Flywheel .	18½″
Height	22½″
Floor space	23″ x 11″
Belt	5/16″ round
Weight	34 lbs.
Price, each ...	**37/-**

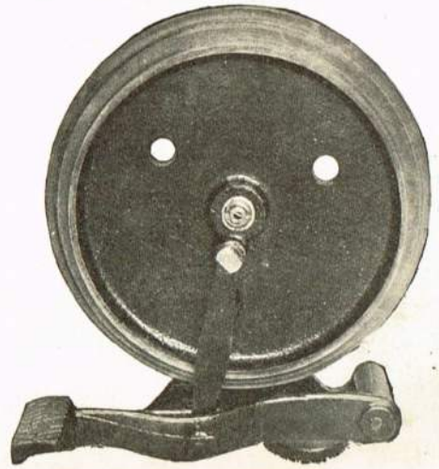


Fig. 6044. Foot Motor for Flat Belt. 3-speed.

Height	16½″
Dia. of steps on flywheel, 15″, 14″, 12¾″.	
Floor space...	17″ x 12″
Weight	56 lbs.
Size belt	1″
Price, each ...	**51/-**

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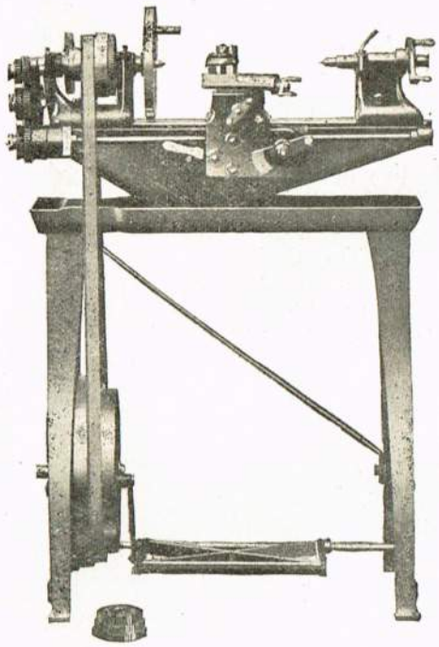

Fig. 6070.

4½-in. HELICAL BACK-GEARED, SLIDING, BORING AND SCREW-CUTTING LATHE.

Specially manufactured for Model and Wireless Engineers.

It has incorporated in it many details that no other small lathe at its price possesses.

Helica backgears	Smooth running.
Hollow tailstock and headstock	Convenient for long, thin jobs.
Change wheels run on keyed bushes	Long life and no sheared pins.
Balanced handles to all controls	Ease of manipulation.

COMPLETE SPECIFICATION.

Bed.—Box casting of cantilever form, accurately machined vees, flat top, and hand-scraped to finish. Lead screw lugs cast integral. Sides and vees are strongly supported by "ribs" cast solid between.

Headstock.—Of substantial design, with bearings "bored" from the solid. Adjustment provided for wear. Cone pulley to take flat 1″ belt. Steps correctly "domed." Back gears are "spiral" or "helical" and give a very sweet motion which enables large work to be executed free from chatter, full provision being made for lubrication. Hollow spindle, which will pass $^{9}/_{16}$″ bars, completes a very useful head.

Tailstock.—Substantial construction, being strongly "webbed," thus can resist strains set up, fitted "turned" **hollow** steel barrel, which is clamped in position by hand screw in convenient position. Balanced handle provides a pleasant and powerful means of "feeding" when necessary.

Saddle and Compound Rest.—Apron is screwed to front of saddle and carries in convenient position. "Clutch" and "quick" return. The clutch being particularly simple and effective can be renewed within a few moments at trifl ng cost. Bottom slide is planed all over and contains three "machined" tee slots, thus obtaining a large surface boring table. Balanced handle being provided with "index." Top slide, carrying tool post, is so designed that there is no chance of "spring" when under cut. Tool post is simple and efficient. Adjusting strips to all slides, again completes this up-to-date unit.

Lead Screw and Quadrant.—Lead screw is "Acme" thread 8 T.P.I., accurately cut and having ample bearing in lugs cast on bed. Right hand lug carrying quadrant which will swivel to any position. This carries the studs and change wheels. Keyed bushes are fitted to all studs and nicely knurled nuts keep change wheels in place. A full set of wheels provided which will cut all threads in common use. We can supply a 63 wheel for "metric" threads at a small extra cost. All change wheels are machine cut.

PRINCIPAL DIMENSIONS.

Admits between centres	16″	Centre Morse Taper	No. 2
Swings over bed	8½″	Back gear ratio	7—1
Diameter of faceplate	8¾″	Lead screw	8 T.P.I.
Width of belt	1″	Size of tools taking	½″ square
Diameter of hole through spindles	$^{9}/_{16}$″	Approximate weight	120 lbs.
Diameter of spindle	1″		

Price: Without stand **£15 10 0**
Of stand and foot motor **£5 0 0**

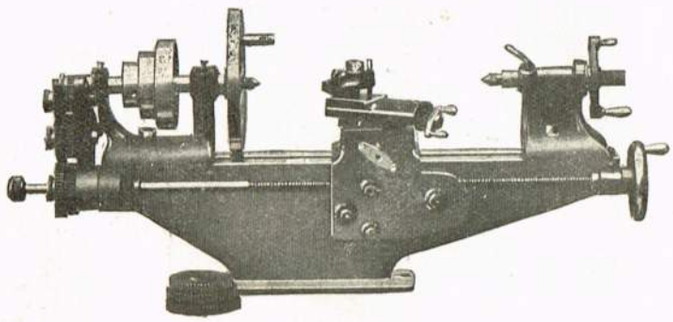

Fig. 6071.

4½-in. SLIDING, BORING, MILLING, AND SCREW-CUTTING LATHE.

This is exactly similar to lathe listed above, in all respects of material, workmanship and finish, also details, with the exception that we do not fit a quick return to saddle, and clutch is removed to left hand end of lead screw, thus enabling us to fit a solid nut. Hand wheel is provided at right hand end of screw, and is a convenient means of moving the saddle and incidentally of turning parallel.

Price: Lathe only **£7 10 0**
Stand and foot motor **£5 0 0**

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LATHES.

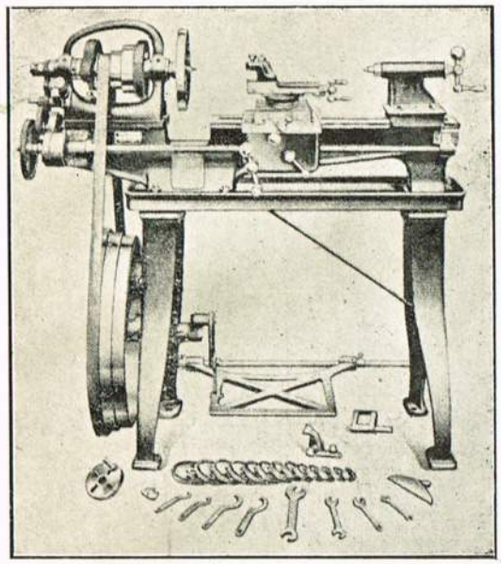

Fig. 6072.

5-inch PRECISION SLIDING, SURFACING AND SCREW-CUTTING LATHE.

For power or treadle drive. High-class workmanship and unique design. Machine-cut gears. Ball thrust.

Price on application.

DIMENSIONS.

Height of centres	5″	Diameter of front spindle bearing	$1\frac{1}{8}$″
Length of bed	3′ 5″	Number of steps	3
Admit between centres	20″	R.P.M. of countershaft	300
Swing over saddle	$8\frac{1}{2}$″	Diameter of driving pulley	$5\frac{3}{4}$″
Swing of gap	$15\frac{1}{2}$″	Width of driving pulley	$3\frac{9}{16}$″
Width in gap	$4\frac{1}{2}$″	Floor space	2′ 0″ × 4′ 6″
Width of bed	5″	Weight of treadle type lathe	435 lb.
Hole in spindle	$\frac{9}{16}$″		

The countershaft is fitted with ring lubricating bearings.
The treadle is extremely strong, and is fitted with a suitable fly-wheel.

Accessories included :—1 only face plate, $8\frac{5}{8}$″. 1 driving chuck. 1 following rest. 1 hand rest with 2 tees. 1 only set of 17 carefully cut change wheels, including the 127 for metric standard. 1 only complete treadle motion with belt and spanners.

A lever is fitted in the headstock, which enables the operator to stop or change the direction of travel instantaneously. In similar lathes it is usual to change the gears.

To hold change wheels in position, pull bush to release an open washer, when the wheel will slip over the spring bush.
T-slotted saddle for boring and milling.
This lathe is of neat appearance, and combines all the advantages of a modern lathe with a wide range utility. It is strong and well built, accurate in workmanship, and is suitable for quick and accurate work without requiring much power. It is designed for self-acting, sliding, surfacing, and for cutting threads of $\frac{1}{64}$—$\frac{1}{2}$″ pitch, Whitworth standard, including gas thread, and 0.2—7 millimetres metric standard, according to the fixed table ; larger pitches according to calculation.

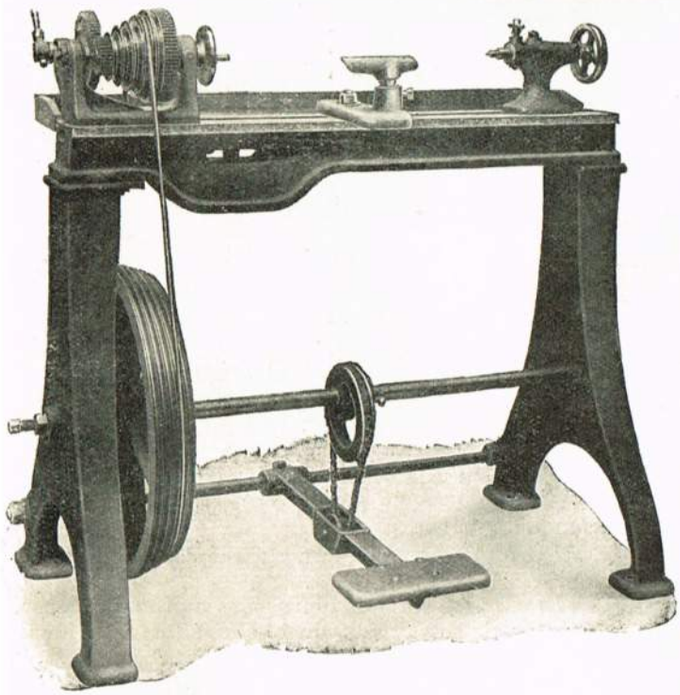

Fig. 6073.

"EXHIBITION" HAND AND POWER LATHE.

Two sizes. 5″ and 6″ centres.

For metal or wood turning.

DIMENSIONS.

	5″	6″
Size of spindle nose	$\frac{7}{8}$″ Whit.	$1\frac{1}{4}$″ Whit.
Width of flat belt	1″	$1\frac{1}{4}$″
Diameter of round belt	$\frac{5}{16}$″	$\frac{7}{16}$″
Size of head cone	6″ to 3″	8″ to 4″
Length of bed	4′ 0″	5′ 0″
Depth of bed	$3\frac{5}{8}$″	$4\frac{5}{8}$″
Admits between centres	31″	36″
Diameter loose head spindle	$\frac{7}{8}$″	$1\frac{1}{4}$″
Morse taper centres	No. 1	No. 2
Size of treadle cone	22″	22″
Size of treadle shaft	$1\frac{1}{4}$″	$1\frac{1}{2}$″
Floor space required	4′ 6″ × 2′ 6″	5′ 6″ × 2′ 6″
Weight as illustrated	4 cwts.	$6\frac{1}{2}$ cwts.
Size of gap	$2\frac{3}{4}$″×5″	$4\frac{1}{2}$″×6″
Size of counter pulleys	6″ diam. For 1″ belt.	8″ diam. For $1\frac{1}{2}$″ belt
Size of tools	$\frac{5}{8}$″×$\frac{1}{2}$″	$\frac{3}{4}$″×$\frac{1}{2}$″

3-Step cone pulley for either flat or round belts.
Supplied with back board, full length.
Two ordinary centres and one fast centre for wood are supplied.

The Single Speed countershaft is provided with cone, and fast and loose pulleys for flat belt. All slides are hand scraped and well fitted. The workmanship and materials used are of the best quality.

	Price—5″ Lathe.	Price—6″ Lathe
Standard Lathe on 4′ 0″ straight bed, single-speed fast head, not geared, loose headstock, hand rest, and two tees, two ordinary centres, one fork centre, driving plate and countershaft, three-speed cone for flat bed	**£16 10 0**	**£24 10 0**
Extra for compound slide rest	**£4 15 0**	**£5 10 0**
Extra for double-geared headstock	**£2 15 0**	**£3 5 6**
Extra for gap bed	**£1 0 0**	**£1 5 0**
Extra for treadle motion instead of power	**£2 0 0**	**£2 10 0**
Extra for treadle motion in addition to power	**£4 10 0**	**£5 2 0**
Extra for vee cones instead of flat	**£0 15 0**	**£1 5 0**
Extra or deduct for 6″ of bed more or less	**£0 10 0**	**£0 15 10**
Extra for plain drill holder with $\frac{3}{8}$″ diameter hole	**£0 10 0**	**£0 10 0**
Extra packed and delivered F.O.B. British port	10%	10%

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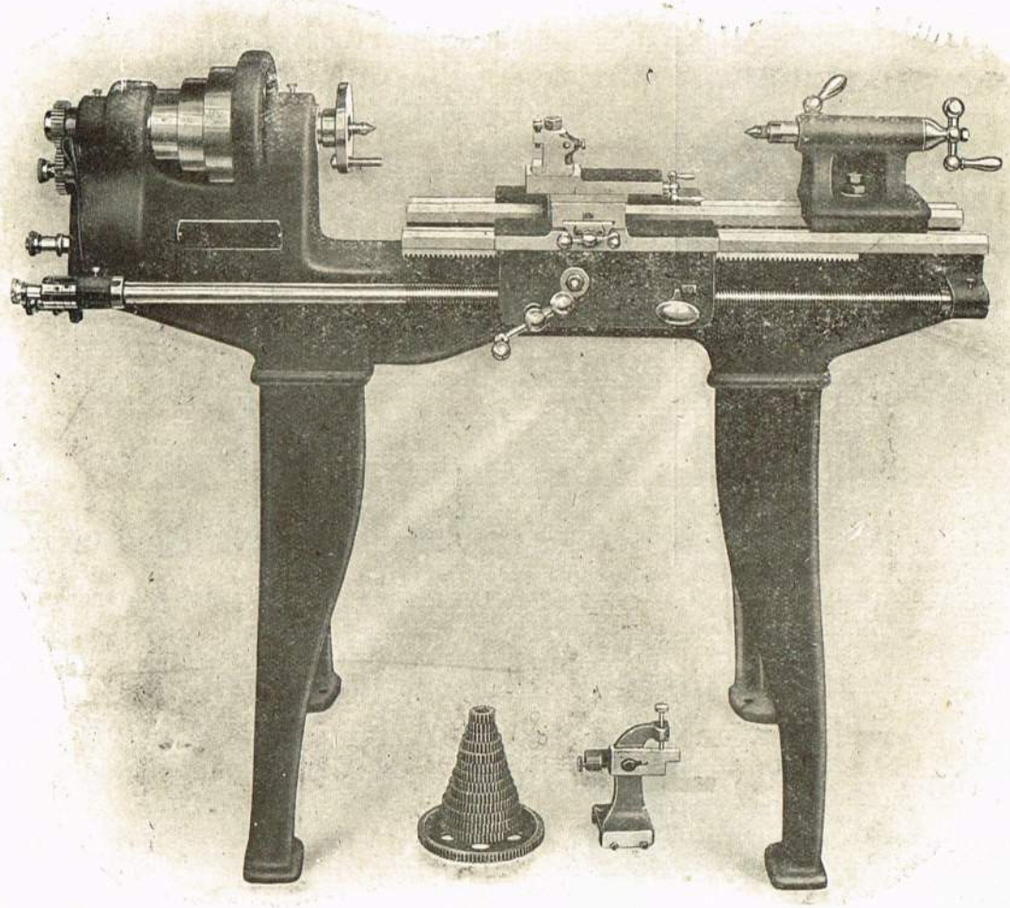

Fig. 6074. THE "BANTAM" LATHE.

10″ Swing, Self-Acting, Sliding, Screw-Cutting and Boring Lathe, with Vee Gap Bed.

Headstock.—Cast solid with bed, long adjustable parallel phosphor-bronze bearings front and back, hollow spindle with $\frac{3}{4}$″ hole right through, fitted with ball thrust. Cone of large diameter. Back gear carried in bed giving maximum rigidity and dispensing with the use of awkward guards.

Bed.—Is extremely broad, deep and heavy, thoroughly braced with cross webs, and is well proportioned throughout to withstand vibration and strain.

Loose Head.—Massive with long bearing on bed and base, and is adjustable for taper turning. The spindle is of large diameter with long movement, and is bored for No. 3 Morse taper.

Slide Rest.—Has long and wide bearing surfaces and is graduated for adjusting compound rest, which is fitted, with a new patent tool-holder, enabling the tool to be set at any angle or height without using loose pieces of packing. The screws are always covered, and there are no recesses to harbour dust or chips.

Saddle.—Is wide and heavy, has full length solid bearings on front and back "V" ways; the cross slide screw is indexed.

Apron.—Is of simple construction and rigid; the gears and steel rack are of ample dimensions and machine-cut. The nut has a large bearing surface to provide against wear. A chasing dial is fitted which allows of any thread being easily cut.

DIMENSIONS.

Bed 4ft. long, admits 2ft. between centres, 8″ wide by 6″ deep. Countershaft speed, 300 r.p.m. Cone $6\frac{1}{2}$″ to 4″ for $1\frac{3}{8}$″ belt. Front bearings $1\frac{3}{4}$″ diameter by $2\frac{3}{4}$″. Hole through spindle $\frac{3}{4}$″ diameter. Swings over saddle 7″ diameter. Admits in gap 14″ by 3″ wide in front of face plate. Approximate weight with countershaft $4\frac{3}{4}$ cwt., ditto with treadle $5\frac{3}{4}$ cwt.

The Lathe is provided with catchplate, face plate, change wheels and table to cut Whitworth and Metric threads, travelling stay, spanners, and countershaft or treadle.

PRICE. F.O.R. WORKS.

With Countershaft	**£28 0 0**	nett.
With Treadle	**£31 0 0**	,,
With Treadle and Countershaft	**£33 0 0**	,,

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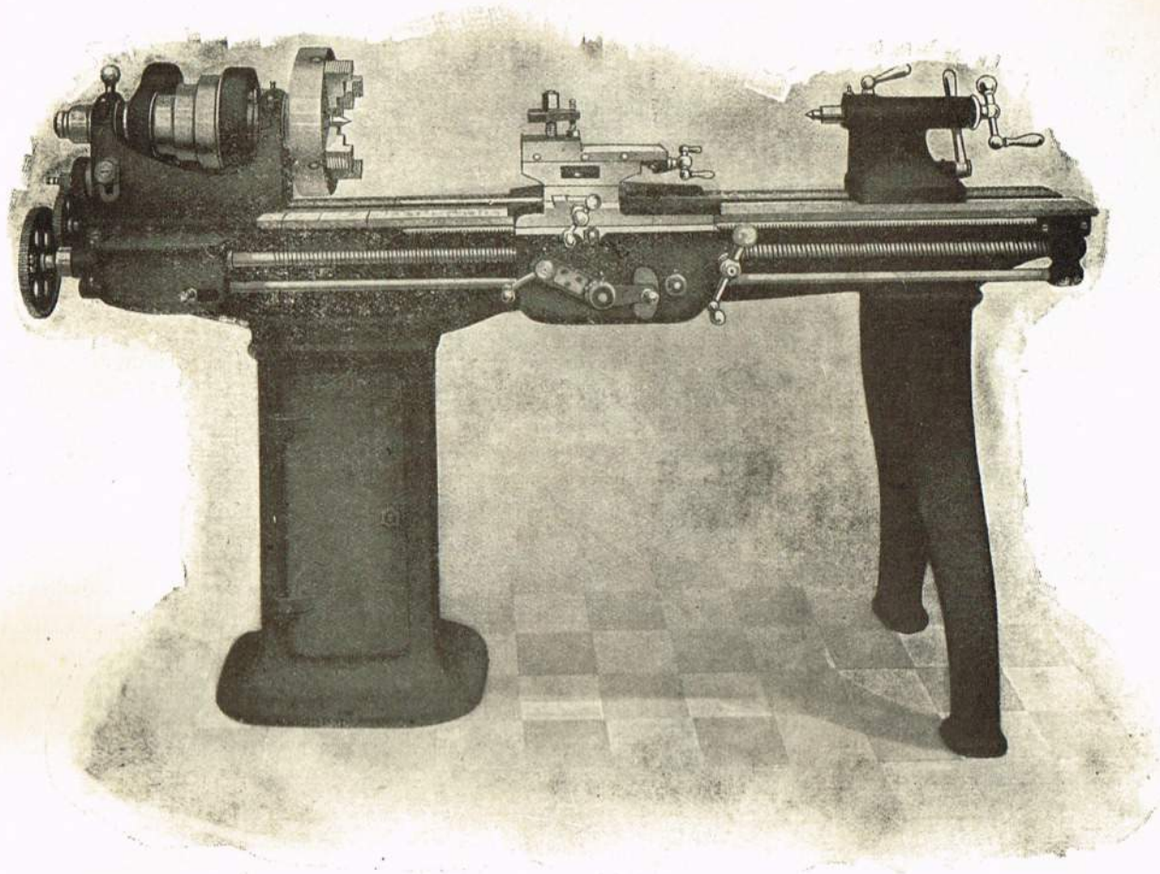

Fig. 6075.

THE "ASCOT" 7″ Centre SELF-ACTING, SLIDING, SURFACING AND SCREW-CUTTING PRECISION LATHE.

$1\frac{3}{8}''$ hollow spindle. V-bed, gap.

Heavy design lathes, with cabinet leg and front shaft, made of best materials, carefully machined and excellent finish. The headstock, slide rest and loose headstock are of heavy construction. Lead screw and spindles are of steel, and all gearing, including change wheels, are machine-cut from the solid. Cutting both Whitworth and millimetre threads. Adjustable gun-metal bearings. End thrust of bearings taken on ball bearings. Countershaft has oil-ring bearings.

DIMENSIONS.

Centre over bed	7″	Admits between centres	39″
Centre over gap	$9\frac{3}{4}''$	Width of bed	10″
Length of bed	5′ 7″	Diameter of chuck supplied	13
Width of gap	$6\frac{1}{4}''$		

Weight, approx., 980 lbs.

COUNTERSHAFT :

Diameter of fast and loose pulley	$6\frac{3}{4}''$	Number and width of steps	$3'' \times 1\frac{1}{2}''$
Width of fast and loose pulley together	$10\frac{1}{2}''$	Revolutions per minute	250

Weight, 90 lbs.

ACCESSORIES SUPPLIED WITH EACH LATHE :

Universal independent chuck with four jaws ; one driver chuck ; one stationary and travelling stay, American pattern ; two protecting caps ; one chuck plate ; one set of change wheels, including one with 127 teeth ; one thread-cutting table ; one complete countershaft ; one set of nut-keys an daerspsnn.

Price ... ... £54 0 0.

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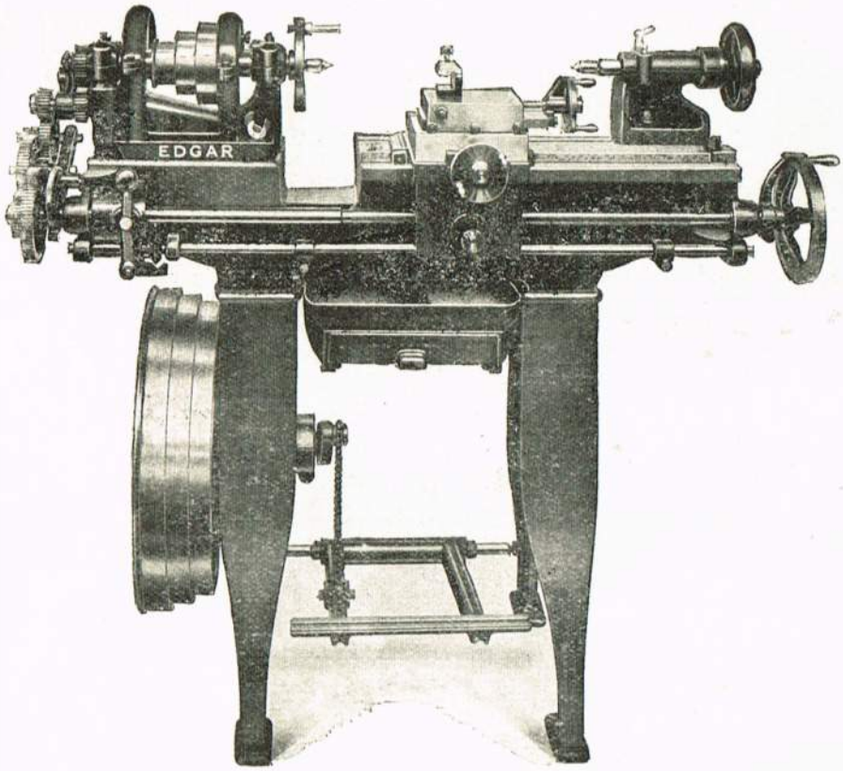

Fig. 6090.

THE "LITTLE EDGAR"

With permanent gap.

10″ swing. 21″ between centres.

FEATURES.

Will turn, bore or screw-cut tapers up to Morse taper; thereby the inaccuracy and inconvenience of setting over the tailstock centre is obviated.

Surfaces convex or concave.

Divisions on all slides in $^1/_{1000}$th of an inch.

Saddle runs past the tailstock out of the way when drilling.

Has reverse for right and left hand screw-cutting and sliding.

Ball-bearing thrust to headstock spindle.

Milling and boring on surface slide plate with top rest removed.

Tool clamp will swivel and adjust vertically for wear of tool.

Ball-bearings on treadle and countershafts.

Big range of Whitworth and metric threads can be cut with standard set of change gears, also standard gas and brass threads.

Oil pan which also carries a neat drawer containing the change gears.

GENERAL DIMENSIONS.

Height of centres	$5\frac{5}{8}$″
Length of bed	3′ 6″
Diameter of hole in spindle	$^9/_{16}$″
Diameter of nose of spindle	$1\frac{1}{4}$″ B.S.F.T.
Centre hole in both heads	No. 2 Morse
Cones on pulley	$5\frac{1}{4}$″, 4, $2\frac{3}{4}$″ × $1\frac{3}{8}$″ wide
Spindle (hardened) front bearing	$1^9/_{16}$″ × $2\frac{1}{4}$″ long
Swings clear of saddle	$7\frac{1}{2}$″ diameter
Swings in gap	17″
Swings in gap from face plate	3″
Takes between centres	21″
Section of tool	$\frac{3}{4}$″ × $\frac{1}{2}$″
Fast and loose pulleys on C/S	8″ × $1\frac{1}{2}$″
R.P.M.	350
Nett weight (approx.)	$5\frac{1}{2}$ cwts.

STANDARD EQUIPMENT.

Follow steady.

Change wheels for Whitworth and Metric pitches.

Two wrenches.

Countershaft (for power).

Oil pan for either power or foot type.

Drawer for holding change gears.

ADDITIONAL EQUIPMENT.

The various attachments shewn in price list can be supplied and fitted after the machines have been delivered.

PRICES.

Carriage paid.

	£	s.	d.
Price complete with Standard Equipment—			
With countershaft for power only	**35**	**0**	**0**
With treadle motion only	**36**	**10**	**0**

ADDITIONAL EQUIPMENT.

Overhead countershaft for foot machine	**5**	**10**	**0**
Treadle motion for power machine	**7**	**0**	**6**
17″ face plate to fit driving plate	**1**	**18**	**0**
22″ ,, ,, ,, ...		—	
Gears for B.A. threads...	**3**	**10**	**0**
Three-point steady rest	**2**	**10**	**0**
Hand rest	**1**	**15**	**0**
Collet chuck and collets	**8**	**15**	**0**
Additional collets	**0**	**12**	**6**
Prong, square, female, half, ordinary and drill pad centres, each	**0**	**7**	**6**
Drip can and support	**1**	**0**	**0**
Round or square turret	**10**	**0**	**0**
Grinder head (internal and external)	**6**	**0**	**0**
Upright brackets for carrying grinder countershaft	**4**	**0**	**0**
Grinder countershaft (ball-bearing)	**5**	**0**	**0**
Overhead countershaft to fit on above brackets for making power machine self-contained	**5**	**10**	**0**
Vertical milling slide conversion bracket (converts top slide into vertical milling slide	**3**	**15**	**0**
Milling, spur, bevel gear cutting and spiral milling and scroll cutting attachment	**25**	**0**	**0**
(NOTE.—For scroll cutting, upright brackets and grinding attachment, countershaft must be added.)			
Two rows of holes in fast head (90 and 48) with index pointer ...	**4**	**0**	**0**
Adaptor for tailstock centre as spindle nose	**0**	**15**	**0**
Saw table attachment complete with 1 straight and 1 swivel guide, spindle and saw for soft wood and metal	**5**	**10**	**0**
12 assorted carbon steel tools	**1**	**10**	**0**

Fitting back plate to chuck :—

To suit chuck size,	3″	4″	5″	6″	8″	10″	12″
Price	**23/–**	**24/–**	**25/6**	**28/–**	**35/–**	**40/–**	**42/6**

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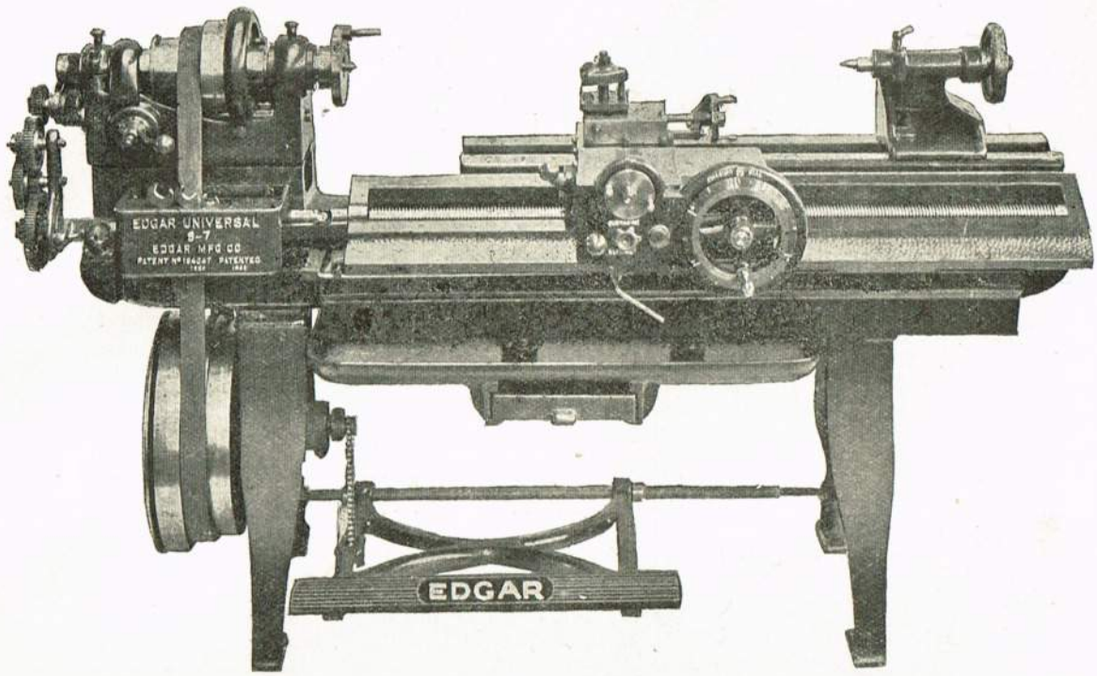

Fig. 6031. THE "BIG EDGAR" with extending gap, 14″ swing, 48″ between the centres.

GENERAL DIMENSIONS.

Height of centres	7″
Length of bed	6′ 2″
Diameter of hole in spindle	$1^1/_{32}$″
Diameter of nose of spindle	$1\frac{7}{8}$″ B.S.F.T.
Centre hole in both heads	No. 2 Morse
Cones on pulley	7″, $5\frac{3}{4}$″, $4\frac{1}{2}$″ × $1\frac{3}{4}$″ wide
Spindle front bearing	$2^5/_{16}$″ × $3\frac{5}{8}$″ long
Swings clear of saddle	10″ diameter
Swings in gap	22″
Swings in gap from face plate	8″
Takes between centres	48″
Section of tool	$1\frac{1}{4}$″ × $\frac{5}{8}$″
Diameter fast and loose pulleys	8″ × 2″
R.P.M.	250
Nett weight (approx.)	12 cwts.

FEATURES.

Will turn, bore or screw-cut tapers up to Morse taper; thereby the inaccuracy and inconvenience of setting over the tailstock centre is obviated.
Surfaces convex or concave.
Divisions on all slides in $^1/_{1000}$th of inch.
Saddle runs past the tailstock out of the way when drilling.
Has reverse for right and left hand screw-cutting and sliding.
Ball-bearing thrust to headstock spindle.
Milling and boring on surface slide plate with top rest removed.
Tool clamp will swivel and adjust vertically for wear of tool.
Ball-bearings on treadle and countershafts.
Big range of Whitworth and metric threads can be cut with standard set of change gears, also standard gas and brass threads.
Oil pan which also carries a neat drawer containing the change gears.

PRICES. Carriage Paid.

	£	s.	d.
Price complete with standard equipment—			
With countershaft for power only	**59**	**10**	**0**
With treadle motion only	**59**	**10**	**0**

ADDITIONAL EQUIPMENT.

	£	s.	d.
Overhead countershaft for foot machine	**7**	**0**	**0**
Treadle motion for power machine	**7**	**0**	**0**
17″ face plate to fit driving plate	**1**	**18**	**6**
22″ ,, ,, ,, ,,	**2**	**15**	**0**
Gears for B.A. threads	**3**	**10**	**0**
Three point steady rest	**3**	**15**	**0**
Hand rest	**2**	**10**	**0**
Collet chuck and collets	**14**	**10**	**0**
Additional collets	**0**	**15**	**0**
Prong, square, female, half, ordinary and drill pad centres each	**0**	**7**	**6**
Drip can and support	**1**	**10**	**0**
Round or square turret	**11**	**0**	**0**
Grinder head (internal and external)	**7**	**10**	**0**
Upright brackets for carrying grinder countershaft	**4**	**0**	**0**
Grinder countershaft (ball-bearing)	**6**	**10**	**0**

	£	s.	d.
Overhead countershaft to fit on above brackets for making power machine self-contained	**7**	**0**	**0**
Vertical milling slide conversion bracket (converts top slide into vertical milling slide)	**3**	**15**	**0**
Milling, spur, bevel gear cutting and spiral milling and scroll cutting attachment (NOTE.—For scroll cutting, upright brackets and grinding attachment, countershaft must be added.)	**32**	**10**	**0**
Two rows of holes in fast head (90 and 48) with index pointer	**4**	**10**	**0**
Adaptor for tailstock centre as spindle nose	**1**	**5**	**0**
Saw table attachment complete with one straight and one swivel guide, spindle and saw for soft wood and metal	**5**	**10**	**0**
Twelve assorted carbon steel tools	**3**	**3**	**0**

Fitting back plate to chuck :—

To suit chuck size, inches	3	4	5	6	8	10	12
Price	**23/–**	**24/–**	**25/6**	**28/–**	**35/–**	**40/–**	**42/6**

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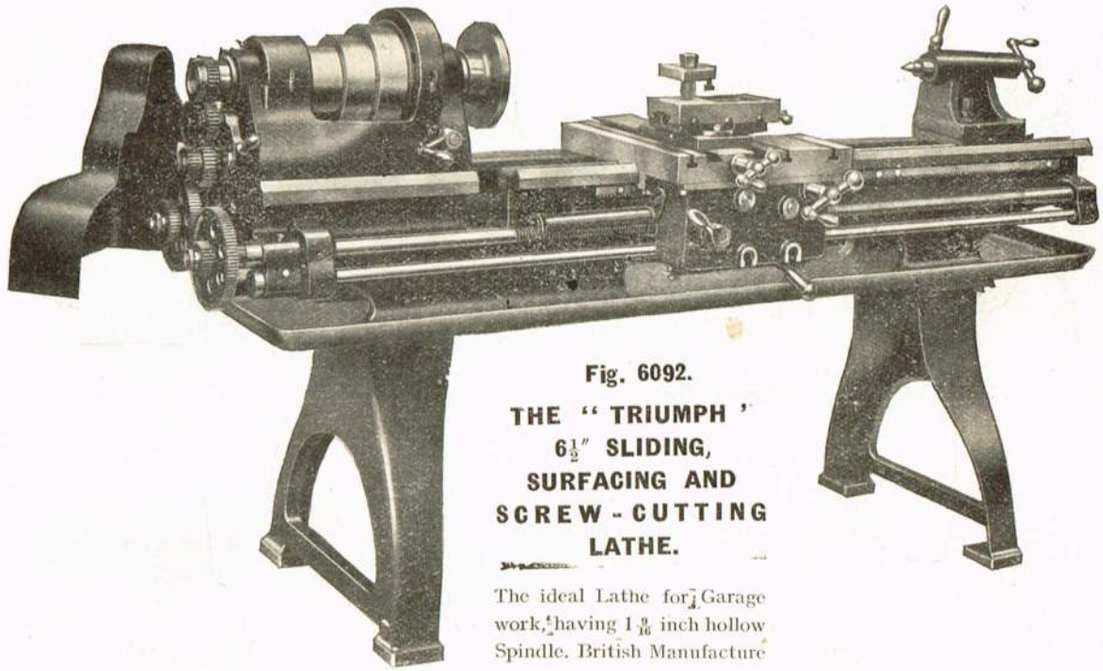
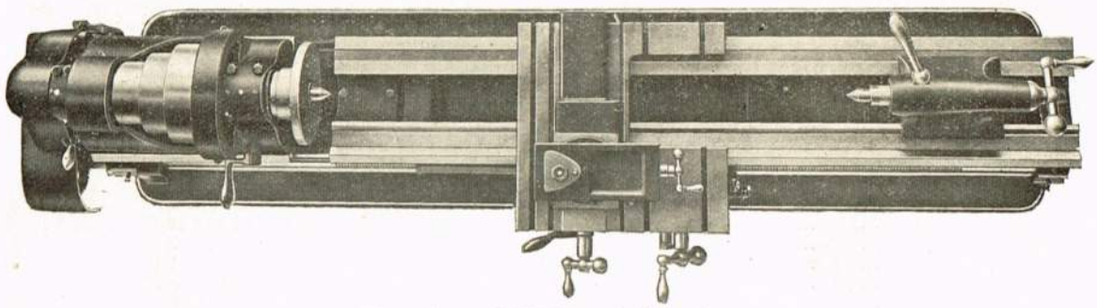


Fig. 6092.

THE "TRIUMPH" 6½" SLIDING, SURFACING AND SCREW-CUTTING LATHE.

The ideal Lathe for Garage work, having 1 9/16 inch hollow Spindle. British Manufacture



Top view of "Triumph" Lathe

COMPLETE SPECIFICATION.

The Headstock is designed so that no spanners are required for the back gear. The small step of the cone is of large diameter, ensuring efficient belt contact at all speeds and making the lathe very powerful.

The reverse is situated at the back of the headstock. Guards are built on to the head as part of its regular equipment.

The Spindle runs in adjustable parallel bearings of phosphor bronze. It is fitted with a ball thrust, and has a 1 9/16" clear hole right through.

The Loose Head will stand up against any work the Lathe is capable of. It has a spindle of large diameter, and is adjustable for taper turning.

The Bed is cast in one piece with the tray, which makes a very rigid casting, and besides other advantages eliminates any possible distortion when bolted on to the legs.

The Slide Rest is indexed and can be swivelled to any angle. The screws are always covered, and there are no recesses to harbour dirt or chips.

The Saddle is T-slotted, and is arranged to present a planed flat surface for bolting work on to, when the slide rest, which can be taken off without disturbing anything else, is removed.

The Apron gears have bearings on each side. None of them overhang, and they run in oil baths. The balanced handle for racking the saddle along the bed is geared down to the rack, making this a very easy sliding motion. The feeds are taken from a separate shaft, and can be instantly engaged and disengaged. The sliding, surfacing, and screw-cutting feeds are all interlocked, so that they can only be engaged singly.

The Screw is used for screw-cutting only. It therefore retains its accuracy and lasts very much longer than on those lathes where it has to perform the triple duties of sliding, surfacing and screw-cutting. In point of fact, this lathe will cut accurate screws long after the other sort are useless for this purpose.

The Lathe is supplied with catch plate, face plate, change wheels and table to cut Whitworth and metric threads, travelling stay, spanners and countershaft.

PRINCIPAL DIMENSIONS.

Bed 6 ft. 6 in. long; admits 4 ft. between centres; is 10 in. wide by 7 in. deep. Countershaft speed 250 revolutions per minute. Three-speed cone, 7½ in. to 4¾ in. for 2 in. belt. Dimensions of front bearing, 2½ in. diameter by 3½ in. long. Admits 1½ in. rough bar through spindle. Swings over saddle 9 in. diameter. Swing in gap 20 in. diameter by 5 in. wide in front of faceplate. Approximate weight for power, 10 cwts.

PRICE Complete, f.o.r. Works .... **£46 0 0.**

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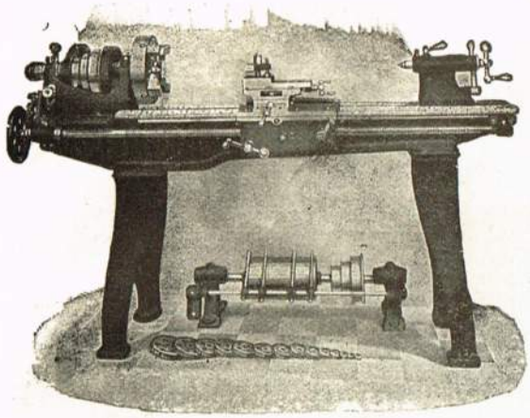


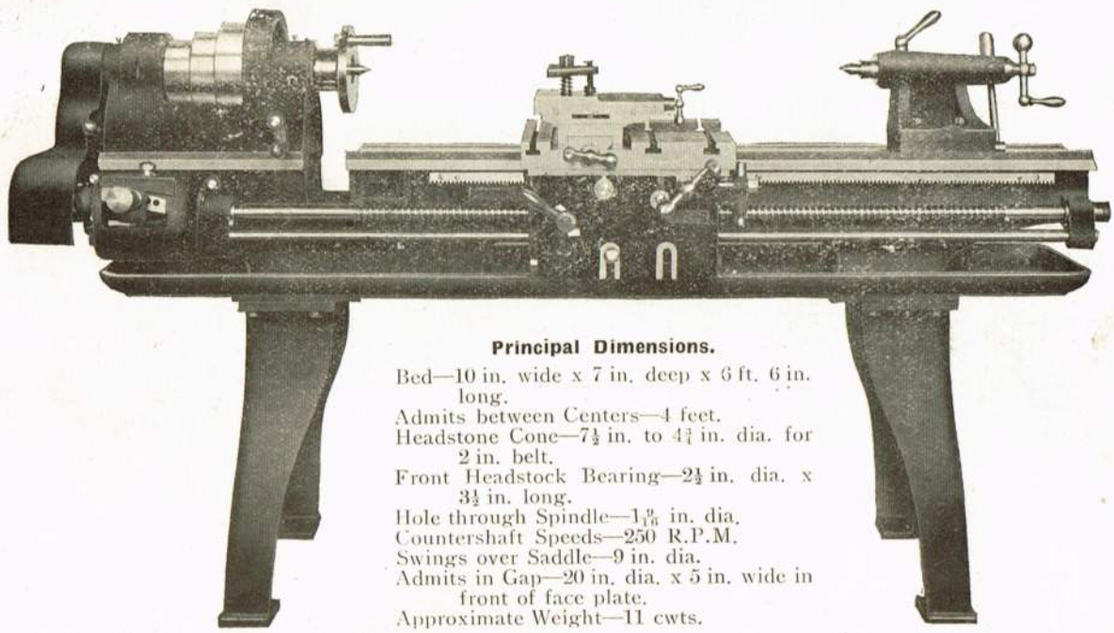
Fig. 6075.

The "Goodwood" 6⅛ inch Self-acting, Sliding, Surfacing and Screw Cutting Gap Bed Lathe, with 1¼in. Hollow Spindle. Well constructed, heavy design, low-priced lathe with V bed. End thrust taken on ball bearings. Plain bearings of gun-metal, adjustable. Tail Stock can be set over for taper turning.

Dimensions.—Centre over bed, 6⅛in. Centre over gap, 8½in. Width of gap, 6in. Length of Headstock, 11⅛in. Length of slide rest, 12½in. Length of Tailstock, 6¼in. Bore of Spindle, 1¼in. Diameter of 4-jaw independent chuck, 10in. Diameter of fast and loose pulleys on countershaft, 5¾in. Width of both pulleys, 10½in. Belt, 1⅜in. R.P.M., 250. Lengths of bed, 4ft 6in., 5ft. 3in., 6ft. Admits between centres respectively, 2ft. 4in., 3ft. 3in., 4ft.

Accessories included—Two-speed ring oil bearing Countershaft, travelling steady, fixed steady, independent 4-jaw Chuck, Driving Chuck, Chuck Plate, set of change wheels for Whitworth and Metric Threads, Gear Guards and necessary Spanners.

Price **£37 0 0.**



Principal Dimensions.

Bed—10 in. wide x 7 in. deep x 6 ft. 6 in. long.
Admits between Centers—4 feet.
Headstone Cone—7½ in. to 4¾ in. dia. for 2 in. belt.
Front Headstock Bearing—2½ in. dia. x 3½ in. long.
Hole through Spindle—1 9/16 in. dia.
Countershaft Speeds—250 R.P.M.
Swings over Saddle—9 in. dia.
Admits in Gap—20 in. dia. x 5 in. wide in front of face plate.
Approximate Weight—11 cwts.

Fig. 6093. The New "Mascot" 6½in. Centre Self-acting, Sliding, Surfacing and Screw Cutting Vee Bed Lathe with Gap and Quick Change Gear Box. 1 9/16 inch Hollow Spindle.

The HEADSTOCK is designed so that no spanners are required for the Back Gear. The small step of the Cone is of large diameter, ensuring efficient belt contact at all speeds, making the lathe very powerful. The six speeds are graded in geometrical progression. The reverse is situated at the end of the Headstock. Guards are built on to the Head as part of its regular equipment.

The SPINDLE runs in adjustable parallel Bearings of phosphor bronze with large bearing surface and is of ample diameter. The thrust is taken by a ball thrust Washer.

The LOOSE HEAD is fitted with a quick locking and quick releasing device, and is designed to obtain and maintain correct alignment. Taper turning adjustment is provided.

The BED is cast in one piece with the tray which makes a very rigid casting and besides other advantages eliminates any possible distortion when bolted on to the legs. It is of large section, well ribbed and has Vee Guides. A removable half-gap piece is fitted which can easily be removed and placed in alignment.

The SLIDE REST is indexed and can be swivelled to any angle. The screw is always covered and there are no recesses to harbour dirt of chips.

The SADDLE is wide and heavy and runs on a long narrow guide. It is "T" slotted, and presents a planed flat surface for bolting work on to, when the slide rest, which can be taken off without disturbing anything else, is removed.

The APRON is of an approved type (patents applied for) which allows of very easy manipulation of the sliding and surfacing feeds by means of a single handle. It is very rigid with double walls so that all gears have double bearings. None of the gears overhang, and they run in oil baths. The balanced handle for racking the saddle along the bed is geared to the rack, thus making an easy sliding motion. The nut has a large bearing surface to provide against wear. The rack and pinion are of steel.

The LEADSCREW is cut from a MASTER SCREW, tested by the National Physical Laboratory, Teddington, in which the maximum error is .00065 in. per ft. It is used for screw-cutting only, and thus retains its accuracy.

The QUICK CHANGE GEAR BOX gives 24 thread pitches from 3½ to 48 per inch, and 24 feeds from 10½ to 144 per inch.

Apron Feeds are interlocked, so that they can only be engaged singly. The Gear Box can only be operated to give one feed or one screw pitch at one time.

The LATHE is supplied with Catch plate, Face plate, Travelling stay, Countershaft and Spanners.

Price ... ... £60 0 0.

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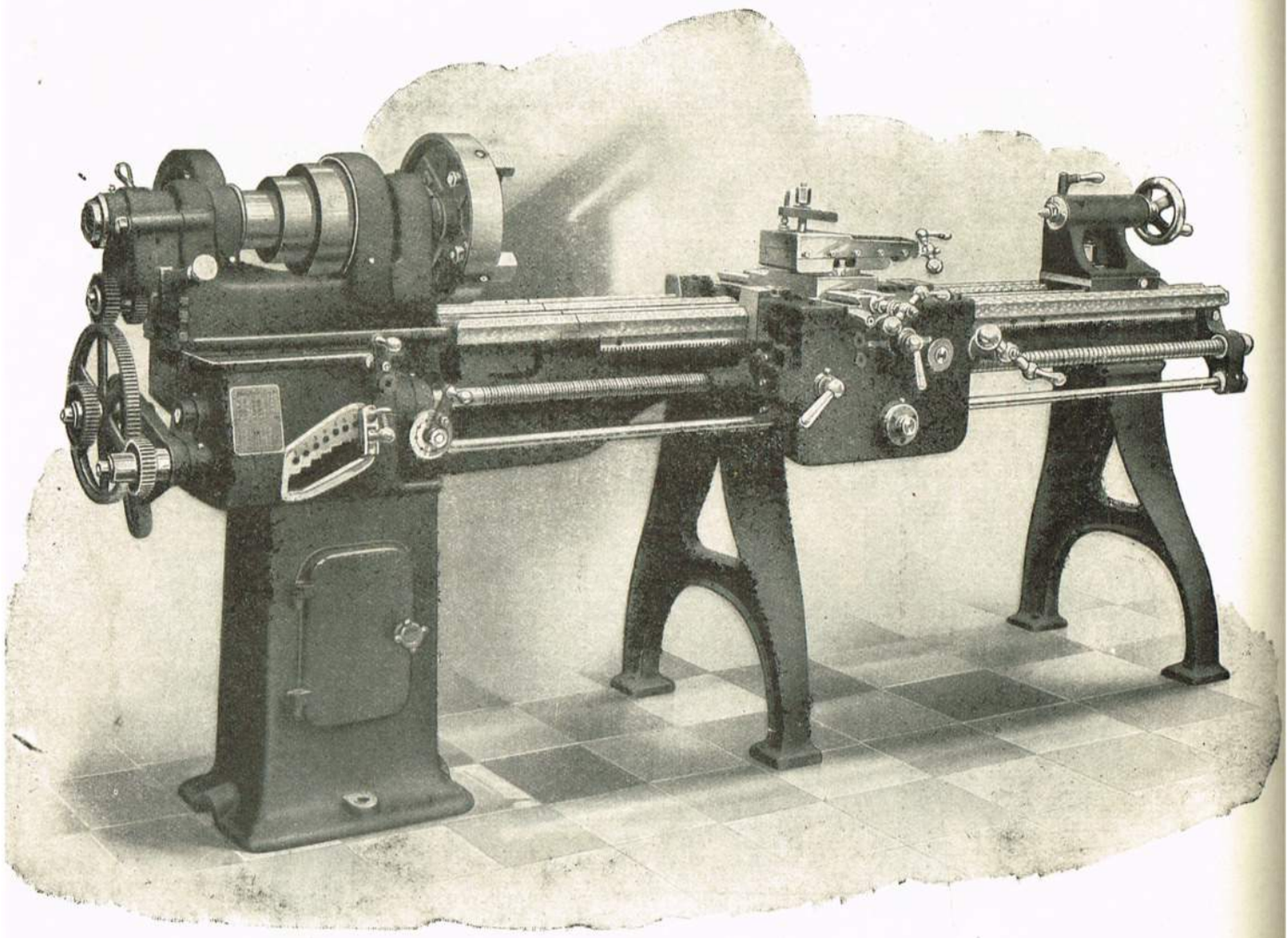

Fig. 6076.

The "Lincoln" $6\frac{7}{8}$ inch, self-acting, sliding, surfacing and screwcutting precision Lathe. $1^{3}/_{16}$ in. hollow spindle, V-bed, gap, cabinet leg and front shaft, Norton Gear Box for 32 different Whitworth threads and Metric threads to be cut by aid of the screwcutting table supplied. Ball bearings take up spindle end thrust. This lathe is of modern and improved construction, extremely strong and specially suitable for easy and economical operation. Two levers on the Norton gear box will give the different speeds indicated on the scale. A further lever is provided for the transmission of the different speeds to the lead screw or front shaft, one of which will only be engaged at a time, the other to be locked up. Besides the 32 different speeds for screwcutting, 32 other speeds consequently can be had for sliding and crossfeeding. The lead screw has 4 threads per inch.

Dimensions.

Centre over bed, $6\frac{7}{8}$ inches. Centre over gap, $10\frac{5}{8}$ inches. Width of gap, 8 inches. Swing above compound rest, $9\frac{5}{8}$ inches. Admits between centres 4 feet 11 inches. Length of bed, 7 feet 11 inches. Width of bed, $10\frac{1}{4}$ inches. Number of steps, three. Width of belt, $2\frac{1}{8}$ inches. Diam. of chuck, $11\frac{3}{4}$ inches. Weight approximately 1,800 lbs.

Length of headstock, $17\frac{1}{4}$ inches. Length of slide rest, $17\frac{1}{8}$ inches. Width of front spindle bearing, $3\frac{7}{8}$ inches. Length of tailstock, $8\frac{1}{2}$ inches. Diameter of fast and loose pulleys, 8 inches. Width of same together, $12\frac{1}{4}$ inches. Width of belt, $2\frac{1}{8}$ inches. R.P.M. of countershaft, 180 and 250. Horse power required, approximately 1 H.P. Weight approximately 120 lbs.

Accessories.

1 Universal independent chuck with four jaws. 1 Driver chuck. 1 Chuck plate. 1 Set of 8 change wheels for metric threads. 1 Stationary and 1 travelling stay American pattern. 1 Screw-cutting table. Complete 2 speed countershaft with oil ring bearings. 1 Set of nut keys and spanners.

Price ... ... £92 8 0.

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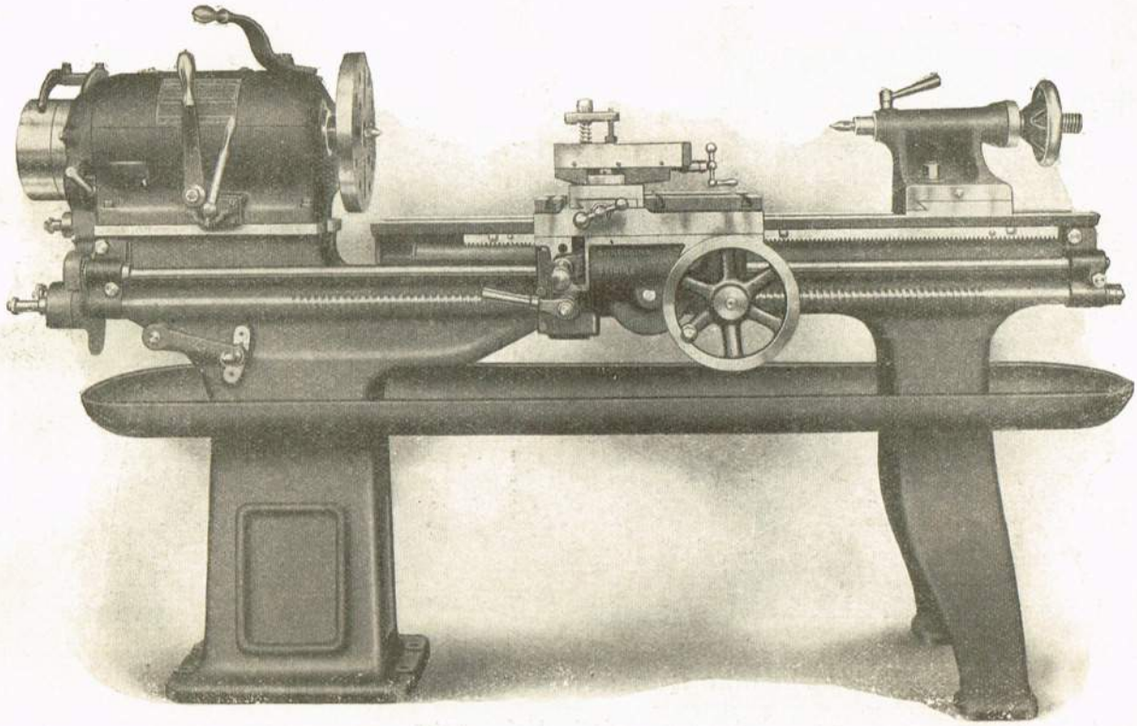


Fig. 6094. 6½″ CENTRE ALL-GEARED HEAD LATHE.

High Speed, Screw-Cutting, Self-Acting, Sliding and Surfacing.

The Bed is a very rigid casting, 10¼″ wide by 7″ deep, with cabinet leg under fast head. The tray shown is incorporated in the design. Pump and telescopic connections can be supplied as an extra.

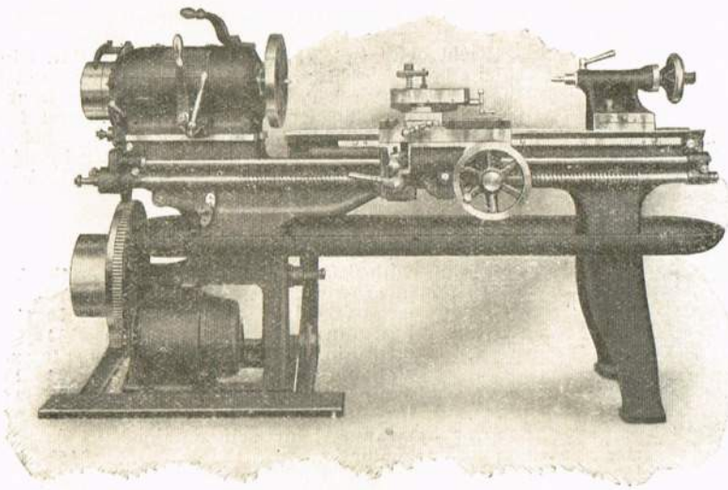
The Headstock gives eight speeds from 20 to 300 revolutions per minute in geometrical progression obtained by heat treated steel gears. It is provided wi.h fast and loose pulleys 8″ diameter, for 2½″ belt and striking gear. The bearings are adjustable parallel bearings in phosphor bronze. Size of front bearing, 2½″ diameter by 3⅜″ long. The thrust is taken by a ball washer. The spindle is of high carbon steel, and has a hole through it to take 1″ bar.

Loose Headstock. The loose head has its spindle passing right through the hand wheel which forms the nut, and is of special design to obtain and maintain correct alignment. Taper turning adjustment is provided.

Slide Rest. The slide rest is indexed and can be swivelled to any angle.

Saddle. The saddle is ⊥ slotted and presents a flat surface for boring work when the slide rest is removed, which can be done without difficulty.

Apron. The Apron Gears all have double bearings, and the worm wheel runs in an oil bath. The rack and pinion are of steel.



6½″ All-Geared Head Lathe arranged for Motor Drive.

The sliding and surfacing feeds are taken from a front shaft, the lead screw being used for screw-cutting only. The sliding, surfacing and screw-cutting feeds are interlocked so that they can only be engaged singly.

Gear Box. A three-feed Gear Box with steel gears is provided, actuated by a handle at the front of the lathe. These feeds can be changed while the lathe is in motion.

The Lathe is provided with catchplate, 12″ faceplate, travelling steady, change wheels for metric and Whitworth threads, and spanners.

Length of bed, 6ft.; admits 3 ft. 3 in. between centres, and 20 in. diameter by 6 in. wide in gap.

Approximate weight, 14 cwts.

PRICES, f.o.r. Works:

With countershaft	**£102 0 0**
Arranged for self-contained motor drive (as illustrated)	**£129 0 0**
Complete with 1¼-h.p. motor and starter	**£149 0 0**

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LATHES.

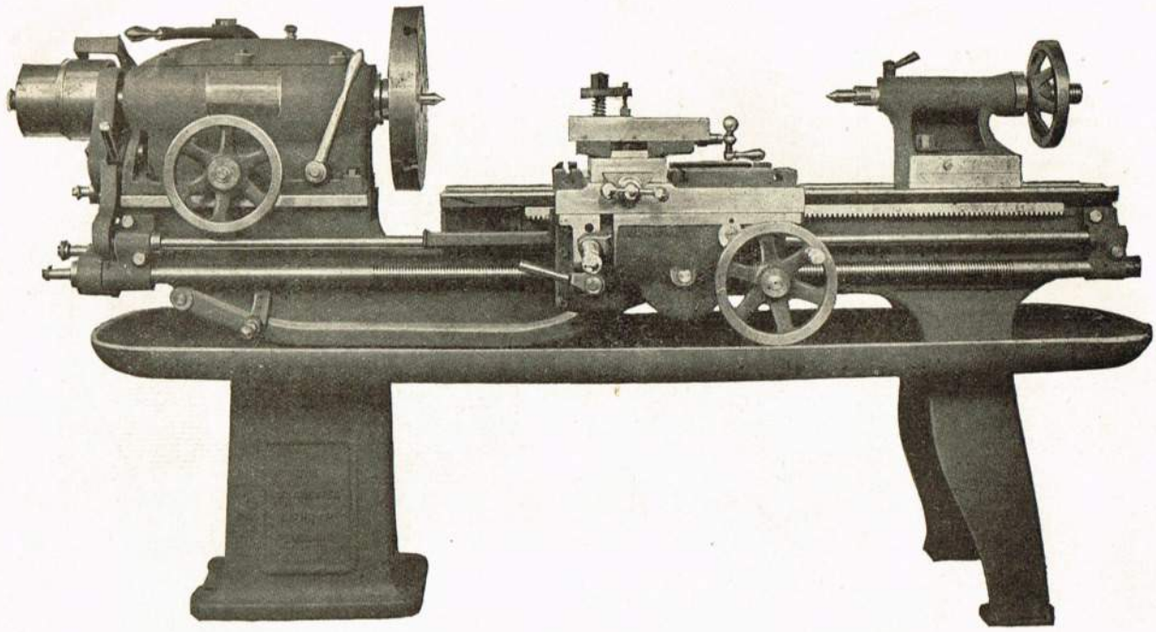


Fig. 6095. ALL-GEARED 7½″ CENTRE HIGH-SPEED GAP LATHE.

Hole through spindle $1^{9}/_{16}$″ diameter.

The Bed is of large section, well ribbed, is 12 in. wide by 8 in. deep, and has a cabinet support under the headstock end forming a cupboard.

The Headstock, being totally enclosed, affords protection from dirt and chips, and forming an oil bath, ensures perfect lubrication. The six changes in geometrical progression are obtained by clutch and sliding gears, so arranged that no two speeds may be inadvertently engaged at the same time.

The Feed Box is arranged with sliding gears to give three changes, and, as in the case of the headstock, only one set of gears can be engaged at once.

The Saddle is flat-topped with tee slots for boring work.

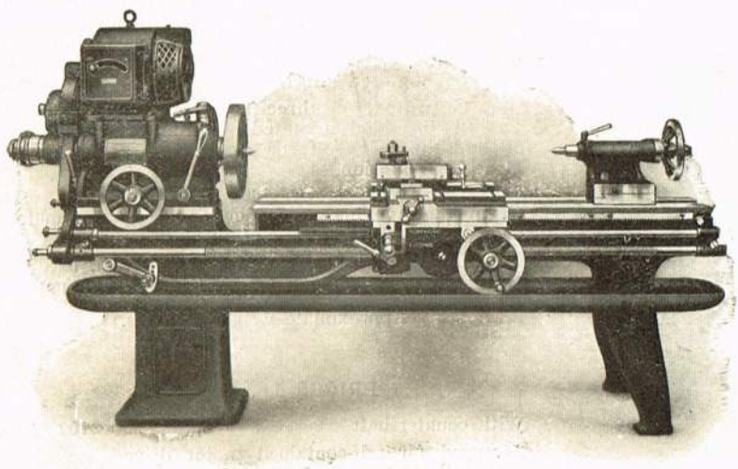
The Painted Apron is double walled and very rigid. The sliding, surfacing and screw-cutting are compactly arranged and interlocked, so that it is only possible to use one motion at a time.

The Slide Rest is indexed and can be swivelled to any angle.

The Loose Head may be set over for taper turning without loosening the base from the bed.

The rack and all sliding gears are of steel, and all gears are machine cut from the solid.

All bearings and wearing surfaces are of ample proportions.



7½″ All-Geared Head Lathe, arranged for Motor Drive.

PRINCIPAL DIMENSIONS.

Height of centres, 7½ in.; length of bed, 6 ft. 6 in.; admits between centres, 3 ft. 3 in.; swings over saddle, 10½ in.; swings in gap, 24 in.; width of gap in front of plate, 7½ in.; diameter and width of fast and loose pulleys, 7 in. by 3¼ in.; speed, 300 r.p.m.; hole in spindle, $1^{9}/_{16}$ in.; front bearing 3″ diameter by 4½ in. long; face plate, 14 in. diameter; change wheels for Whitworth and metric threads.

PRICE f.o.r. works

For Lathe with 6 ft. 6 in. bed	**£119**	**0**	**0**	
Extra for square turret	**£10**	**7**	**6**	
,, large faceplate	**£5**	**15**	**0**	
,, 7 ft. 6 in. bed	**£4**	**0**	**0**	per ft. extra
,, 8 ft. 6 in. bed				
,, stationary steady	**£4**	**2**	**6**	
,, pump and connections ...	**£7**	**7**	**0**	
,, if motor-driven, 2½ h.p. starter	**£173**	**0**	**0**	
,, arranged for self-contained motor	**£146**	**0**	**0**	

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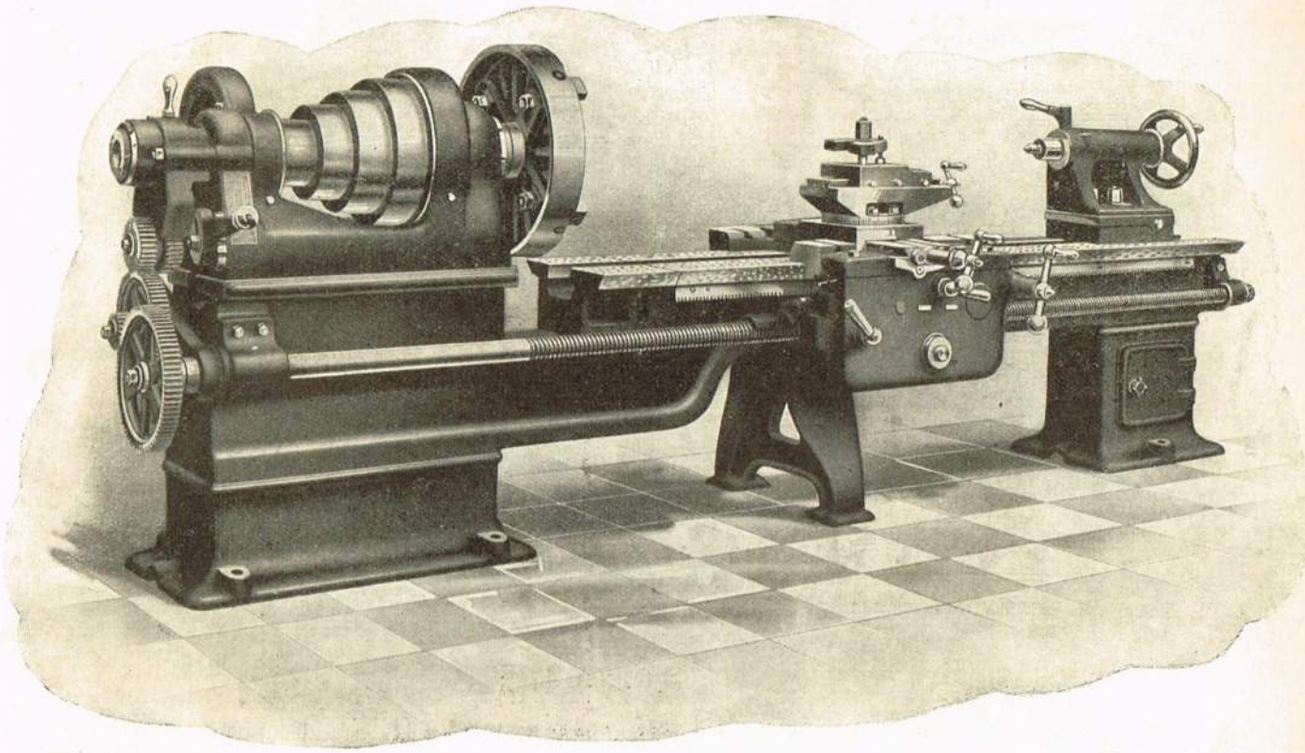

Fig. 6077.

THE "EPSOM" 12″ Centre SELF-ACTING SLIDING, SURFACING AND SCREW-CUTTING PRECISION LATHE.

With 2⅜″ hollow spindle, gap, two cabinet legs. End thrust of spindle taken on ball-bearings. Cutting both Whitworth and millimetre threads.

A lathe of heavy design but well-proportioned. Made from best material and workmanship of the highest.

The headstock, etc., are of rigid design. Spindles made from best forged steel, run in long adjustable gun-metal bearings with taper outsides. The lead screw has two threads to the inch. All gears are machine-cut from the solid.

Included in the outfit are the following accessories : One Universal chuck with four jaws ; one driver chuck ; one stationary and one travelling stay, American pattern ; one set of 15 change wheels, including one of 127 teeth ; one screw-cutting table ; complete countershaft for two speeds with oil ring bearings ; one set of nut keys and necessary spanners.

DIMENSIONS.

Size	Centre over gap inches	Centre over bed inches	Swing above compound rest inches	Width of gap inches	Admits between centres ft. ins.	Length of bed ft. ins.	Width of bed inches	No. of steps	Width of steps inches	Price each
2	18¾	12	18½	17¼	6 5	11 3	15½	4	3³/₁₆	£171 12 0
4	18¾	12	18½	17¼	9 10	14 8	15½	4	3³/₁₆	£186 5 0
6	18¾	12	18½	17¼	13 0	17 10	15½	4	3³/₁₆	£198 0 0

Diameter of faceplate, all sizes, 21⅝″. Weight (2), 5500 lbs. ; (4) 6100 lbs. ; (6), 6700 lbs. Length of headstock, 28¾″. Length of slide rest, 24¾″. Front spindle bearing width, 5½″. Length of tailstock, 14⅜″.

Countershaft.—Diameter of fast and loose pulley, 13¾″ ; overall width, 20″ ; belt width, 3³/₁₆″ ; r.p.m., 140 and 180. H.P. required, 2½. Weight, 350 lbs.

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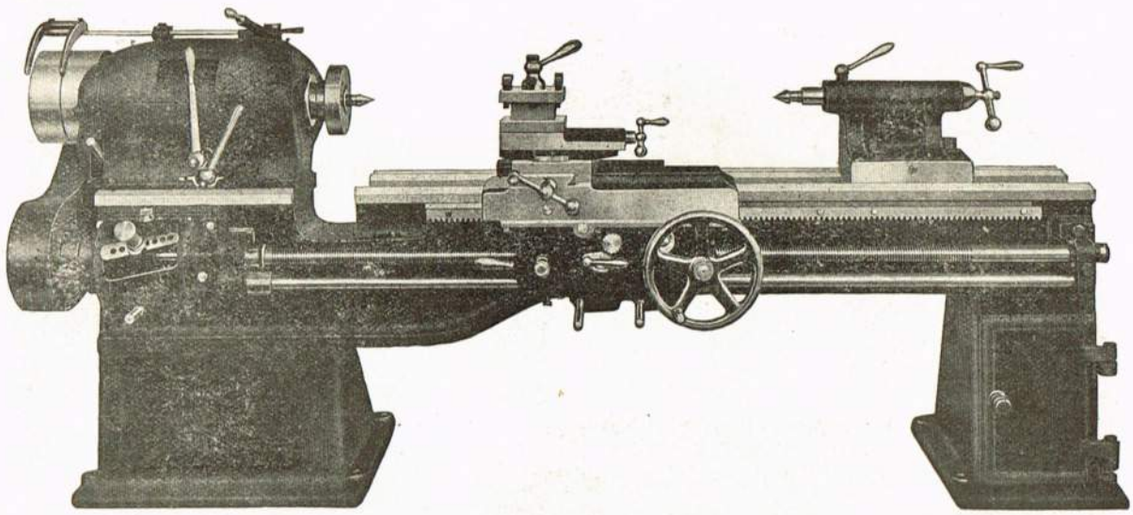

Fig. 6096. 17″ SWING LATHE WITH GAP VEE BED.

The Gap Bed Lathe will swing 26″ × 7″ in front of the faceplate.

SPECIFICATION.

The Bed is a very rigid casting, strongly braced with double wall cross stays and supported on two cabinet feet.

The All-Geared Headstock gives eight speeds from 18 to 305 r.p.m., in geometrical progression through the gears. It is provided with fast and loose pulleys 10″ diameter, 3¼″ wide, running at 300 r.p.m., and striking gear. The adjustable parallel bearings are of phosphor bronze, the front one being 3⅞″ diameter by 4½″ long. The thrust is taken by a ball thrust washer. The spindle, which is made of high carbon steel, has a hole through it to take 2″ rough bar. Two levers control all the speed changes, and any speed can be engaged under five seconds.

The Loose Head is of special heavy design to ensure rigidity and correct alignment ; it is adjustable for taper turning.

The Gear Box is of the quick change type, giving 32 different thread pitches for screw-cutting ranging from 4 to 60 per inch, and 32 feeds ranging from 8 to 120 per inch.

The Saddle is 24″ long, and runs on the front and back " Vees " and the front flat of the bed.

The Apron is of the double-walled type, so that all gears have double bearings. The feeds are taken from a front shaft by means of dropping worms running in oil, the lead screw being used for screw-cutting only. A thread indicator is provided. The sliding, surfacing and screw-cutting feeds are all interlocked, so that they can only be engaged singly. The rack and pinions are of steel.

The Slide Rest is indexed and can be swivelled to any angle. It carries a square turret to take four tools.

PRINCIPAL DIMENSIONS.

The Lathe with 7 ft. Bed admits 3 ft. 4 in. between the centres, swings 17″ over the bed, 12″ over the saddle, and is provided with catc plate, 15″ face plate, travelling stay and spanners. Approximate weight, 25 cwts.

Price £200 0 0

Also made in longer Beds at **£5 10 0** per foot extra.

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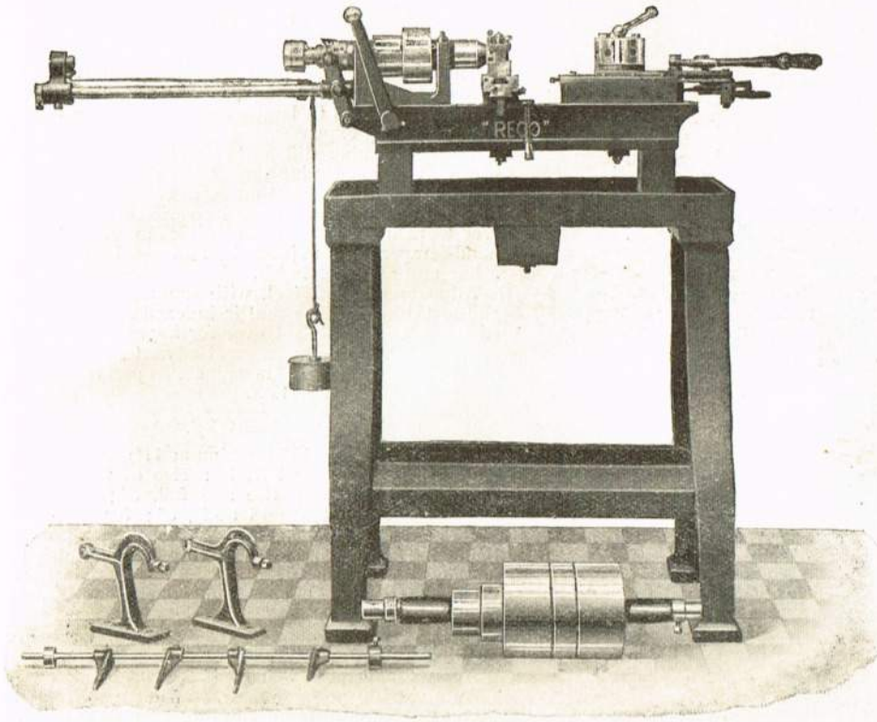


Fig. 6100.

⅝″ AUTOMATIC WIRE FEED CAPSTAN LATHE.

This Lathe is suitable for rapid production of parts from brass and steel, round and section rods.

The Headstock is fitted with steel spindle. The automatic chuck is operated by lever without stopping lathe.

The Capstan Rest is arranged to operate by hand lever. The turret is bored for six tools and has six stops, is revolved and indexed automatically on the return motion of the capstan slide. Turret is provided with lock handle.

The Cutting-off Rest is operated by lever, rack and pinion, and has adjustable stop for form tool operations.

The machine is supplied complete with countershaft and sample collet.

SPECIFICATION.

Swing over bed	7″
Swing over cut off slide	3″
Diameter of turret	3½″
Centre of top of slide	1½″
Greatest distance end of spindle to turret	6″
Face of pulleys on countershaft ...	1½″
Wire feed capacity	⅝″
Diameter of hole in spindle ...	1″
Diameter of holes in turret ...	⅝″
Length that can be turned ...	3″
Cone diameters	3″ and 4″
Countershaft pulleys	6″

Price ... £30 0 0.

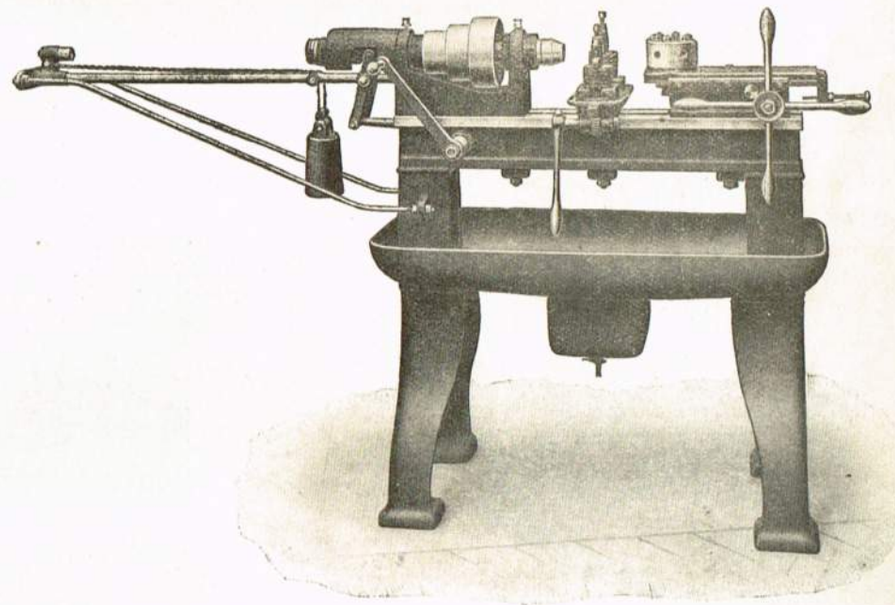
Fig. 6101.

1″ AUTOMATIC WIRE FEED CAPSTAN LATHE.

SPECIFICATION.

Height of centres	6″
Diameter of hole through wire feed	1⅛″
Diameter of holes in turret ...	1″
Size of cone pulley on head	7½″, 6¼″, 5″×2½″
Size of cone pulley on countershaft	9½″, 8¼″, 7″×2½″
Tight and loose pulley on countershaft	8″×2½″
Length that can be machined ...	4″
Maximum stroke of turret ...	4¼
Size of tool steel for tool posts	½″×¾″
Length and width of bed	3′ 6″×6″
Approximate floor space	6′ 10″×1′ 9″
Speed of countershaft for high-speed brass work	500 r.p.m.
Speed of countershaft for mild steel work	260 r.p.m.
Approximate weight ...	10 cwts.
Weight packed for shipment	12 cwt.
Dimensions of case	4′ 3″×2′ 6″×5′

Code word ... ... Basic
Pump and fittings extra.
Code word with pump and fittings ... Bask



DESCRIPTION. Price on application.

This illustration shows a new design of Capstan Lathe for the quick production of work from the bar. The manufacturer and operator have been studied in this design, for rapid production and ease in manipulation.

The Head is fitted with parallel phosphor bronze bearings with taper adjustment, end thrust being taken by a ball thrust washer. Both bearings and thrust washer are protected by dust caps.

The Wire Feed is compound locking, thus ensuring a tight and uniform grip of stock, and requires very little exertion for the operator to manipulate.

The Capstan Turret revolves automatically, and is arranged to carry six tools. All parts are properly indexed, hardened and ground to a fit, and a bolt is fitted inside to keep turret from revolving, when necessary. The bearing surfaces are wide and long, and have adjusting pins and strip to take up wear.

The Cross Slide has two tool posts, adjustable in **T** slots. A two-start screw gives quick movement when in operation for forming or cutting off.

The Countershaft Pulleys and Cone are turned and balanced to save wear and vibration. The pulleys have long bearings and oil tubes fitted to give ample lubrication. Ring oil bearings are fitted.

A large range of Automatic Lathes in stock.

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HAND SHAPERS AND PLANERS.

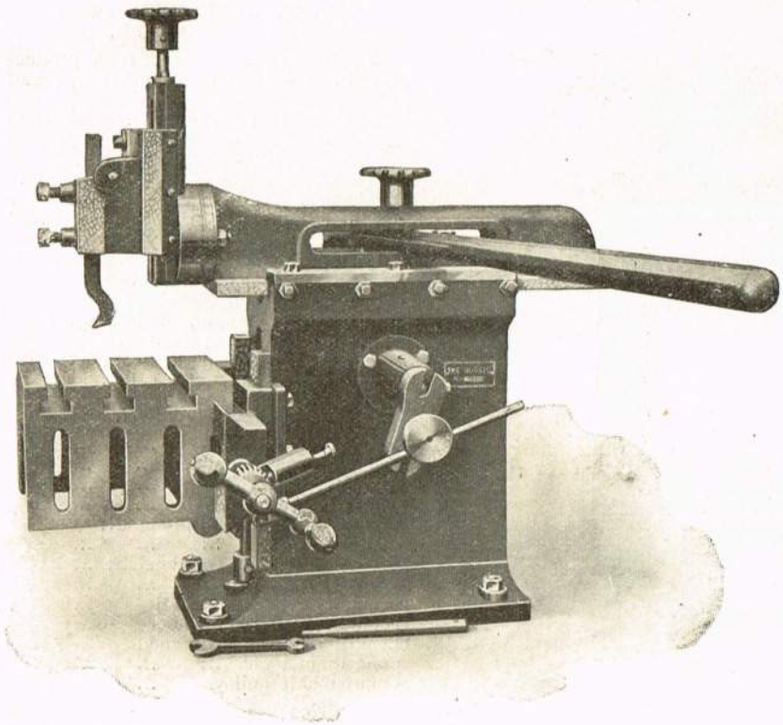


Fig. 6102.
HAND SHAPER.

This machine has been designed to meet the needs of small works and garages, and will be found very useful in larger works in cutting down file and fitting expenses.

There are nine different working positions of handle, the ram having three holes and the handle three holes, the self-acting feed being regular in all positions. The feed can be varied from one to four teeth in two seconds, all slides are accurately hand-scraped and adjustable, and the tool leaves a fine and accurate finish.

All screws are of steel, with square threads and gun-metal nuts. The ram is indexed and the top slide can be quickly set over for angular work.

The central drive has a great advantage over the old patterns, and the machine is operated with the minimum of exertion.

DIMENSIONS.

Length of stroke 10″ (maximum 11″), self-acting cross travel, right or left, 9″; size of table top, 7″ × 6″; depth, 5″; rise and fall, 5″; greatest distance between tool and table, 5″; 3 ⊥ slots in table for ½″ bolts machined from solid; size of tool, ½″ square; size of hole through main body for key-way cutting, 1½″.

One tool, one spanner, and one tommy are provided with machine.

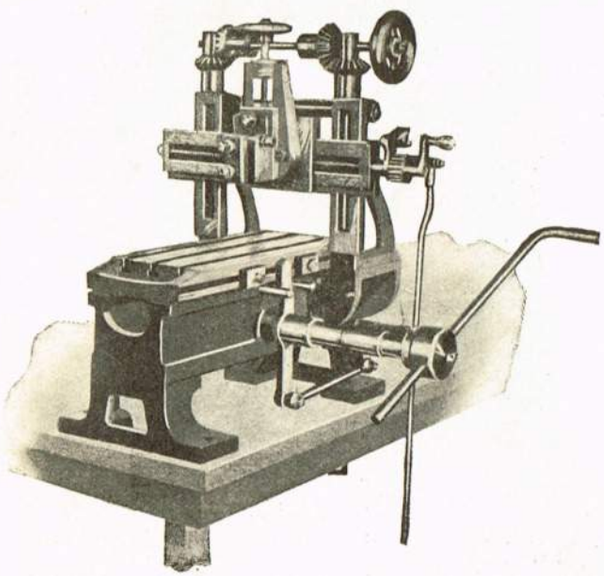
Price **£20.** Free on rail. Carriage forward. Packing case 20/-, returnable.

Approximate nett weight, 1½ cwts.

Approximate gross weight, 2 cwts.

Case measurements for shipment, 25″ × 22″ × 21″.

Quick-action machine vice with indexed swivel base, jaws 3″ wide to take in 7″, for use with above machine, **£3 8 6.**



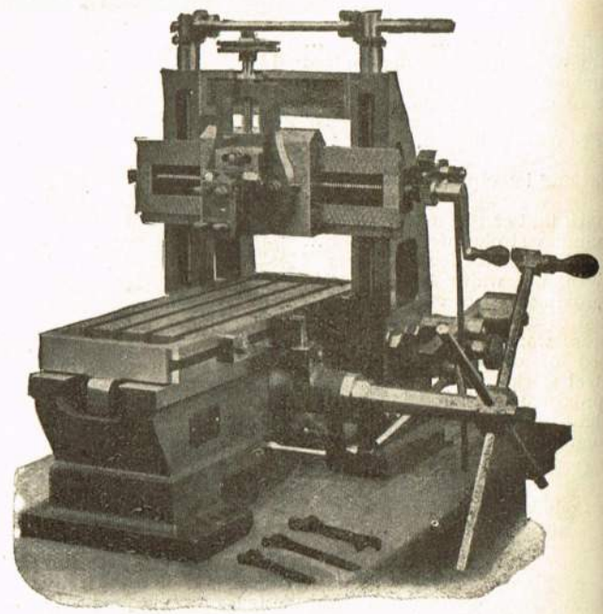


Fig. 6103. HAND PLANING MACHINE OF IMPROVED DESIGN.

These machines are well designed and are accurately fitted. All slides are hand-scraped to standard surface plates and straight edges. The four main screws have square threads and gun-metal nuts. The ⊥ slots are accurately machined out from the solid, and the swivel slides are graduated and indexed for angular work. All sizes of machines have self-acting feed to right or left on the horizontal cut.

No. 1. Bench Machine. To plane 14″ long, 8½″ wide, 6″ deep. Weight 2 cwts. Price complete **£20 0 0**
No. 3. ,, ,, ,, 22″ ,, 10″ ,, 10″ ,, ,, 4½ ,, ,, ,, **£34 0 0**
Box housings bolted to side of bed in No. 3.
No. 4. Bench Machine, as No. 3. To plane 24″ long, 12″ wide, 10″ deep. Weight 5½ cwts. Price complete **£48 0 0**

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SHAPING AND PLANING MACHINES.

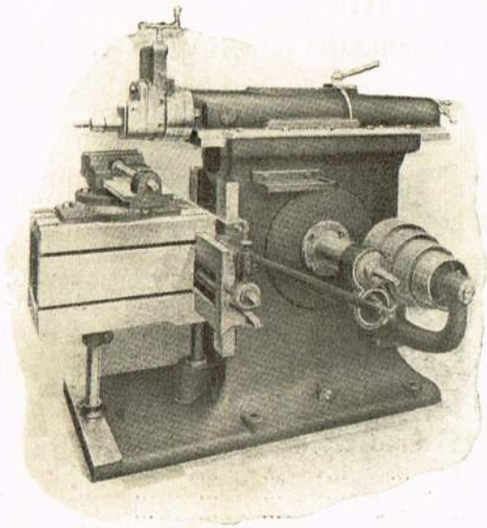

Fig. 6104A. THE "REGENT" 12″ to 22″ CRANK SHAPING MACHINES.

With countershaft and vice. Adjustable stroke while in motion. Many important features are embodied in these machines. A table support is fitted to the 22″ machine only. All have a 4 step cone pulley.

No.	1	2	3
Length of stroke, inches ...	12	16	22
Size of table top, inches ...	12 × 10	16 × 11	22 × 13
Height of table, inches ...	11	12½	12½
Horizontal traverse of table, inches	17½	21½	27
Vice opens, inches	6	8	12
Width of vice jaws, inches...	5½	7	7½
R.P.M. of countershaft ...	150	160	140
Approx. weight lbs. ...	1200	1800	2000
Price	**£50 0 0**	**£66 0 0**	**£96 0 0**

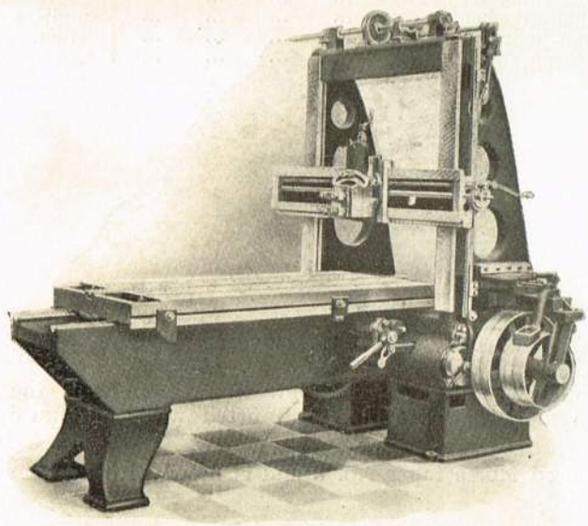

Fig. 6105A. THE "KINGSWAY" PRECISION PLANING MACHINE.

With quick-return stroke effected without jerk. The lubrication of table is automatic. The heavy design tool box is self-acting in the horizontal, vertical and angular cuts. Price includes countershaft and complete set of spanners.

No.	1	2	3	4	5	6	7
Will plane width, inches	24	24	24	33½	33½	33½	33½
Admits between standards, inches ...	24	24	24	35½	35½	35½	35½
Width of table, inches	18	18	18	27½	27½	27½	27½
Will plane height, inches	24	24	24	33½	33½	33½	33½
Will plane length, inches	39	58	77	58	77	98	118
Length of bed, inches	80	80	113	115	148	148	213
Diam. and width of countershaft pulley, inches	11⅞ × 3	11⅞ × 3	11⅞ × 3	13¾ × 3½	13¾ × 3½	13¾ × 3½	13¾ × 3½
R.P.M. of countershaft	500	500	500	450	450	450	450
Cutting speed per second	9	9	9	9	9	9	9
Return stroke per second	23½	23½	23½	23⅝	23⅝	23⅝	23⅝
Approximate weight of machine, lbs.	3300	3650	4300	6800	7700	8100	9400
Price	**£121 16 0**	**£129 12 0**	—	**£198 0 0**	—	—	—

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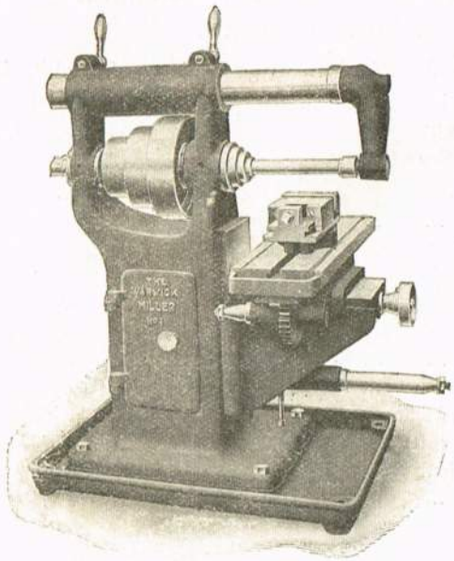
MILLING MACHINES.



The "Warwick" Milling Machine No. 1.

Fig. 6110.

THE "WARWICK" MILLING MACHINE No. 1.

These Milling Machines are specially designed for the manufacture of small parts in quantities. They are suitable for brass-founders, and electrical, steam and gas fittings manufacturers.

The Spindle is hollow and runs in phosphor bronze bearings, the front one of which is taper, both of them being provided with means of adjustment to take up the wear. It is bored Morse taper No. 3.

The Table is moved horizontally and vertically by hand levers, which can be adjusted in any position to suit the operator. Adjustable stops are provided for both movements.

The Vice is swivelling and graduated.

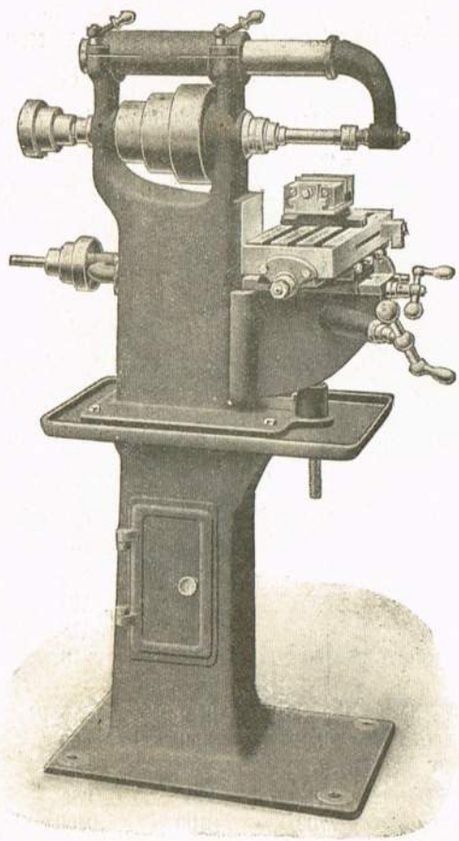
Suitable handles are provided with the machine.

SPECIFICATION.

Surface of table	16″ × 5½″
Longitudinal motion of table	8″
Cross motion of table	4″
Vertical motion of table	5¼″
Cutter mandril	¾″
Speeds of countershaft	350 to 450 r.p.m.

PRICES.

Complete with countershaft	On application.
Graduated swivelling vice, extra	
Vertical milling attachment, extra	
Dividing heads, extra	
Machine fitted on stand, extra	



The "Warwick" Milling Machine No. 2.

Fig. 6111.

THE "WARWICK" MILLING MACHINE No. 2.

These machines are fitted with screw feed throughout, the longitudinal movement is self-acting, and fitted with automatic trip.

Spindle is bored Morse taper No. 3 and is fitted with draw-in bar.

SPECIFICATION.

Surface of table	16″ × 5½″
Longitudinal motion of table	7″
Cross motion of table	2⅜″
Vertical motion of table	7″
Cutter Mandril	¾″ diam.
Size of cone pulley	8″, 6¾″, 5½″ × 2⅛″
Speed of countershaft	... 350 to 450 r.p.m.

PRICES.

Complete with countershaft	On application.
Graduated swivelling vice extra	
Vertical milling attachment	
Dividing heads	
Bench machine	

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MILLING MACHINES.

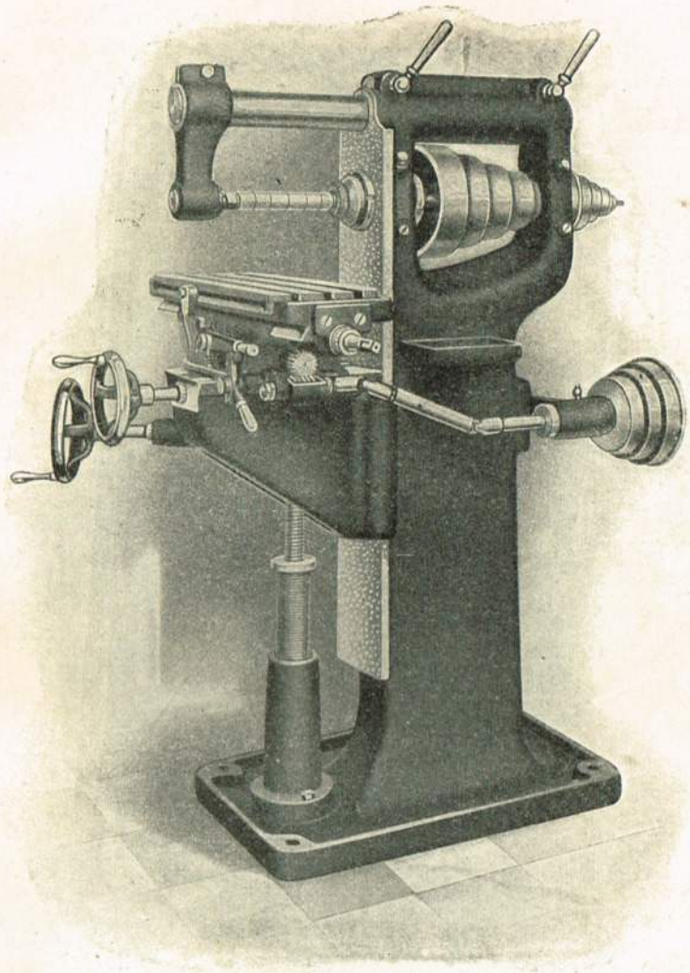

Fig. 6078. The " Perth " Precision Horizontal Milling Machine.

Working surface of table 19¾ in. × 7 in., with self-acting longitudinal motion of working table. **The construction of this machine** is extremely powerful and special care has been taken to guarantee an accurate work so that the machine can be recommended with every confidence. **The column** is a massive and well ribbed box casting in one piece with the base. Its upper portion carries the spindle and overhanging arm and is supplied with a door, so that the inner part can be used as a cabinet for tools and cutters. **The main drive** is actuated by means of the cone pulley, from which 4 different speeds are obtained. **The hollow spindle** is made of best special steel, hardened and runs in large and adjustable dust-proof phosphor bronze bushes. It is carefully ground and provided with ball bearings to take up the end thrust and tapered inside to receive the **cutter arbor,** which latter is secured at the rear end by means of a draw-in attachment. **The table** is of very heavy design so that there is no deflection when clamping work. It has automatic longitudinal motion in both directions with automatic release. The working surface is provided with three **T** slots and oil channel. **The knee** carrying the table has large slides for the cross movement of table and all motions are covered in order to prevent filings or dust from getting into the inner working parts. The **screw** of the **vertical motion** is constructed telescopically. No hole in the floor is wanted. The whole of the knee is so strong that it will prevent the table from any vibration.

Accessories supplied with each machine.

1 Complete countershaft with ring oil bearings. 1 Cutter arbor ⅝ in. 1 Set nut keys and hand wheels.

Working surface of table	19¾″ × 7″
Self-acting longitudinal feed of table	12⅝″
Cross movement of table	5⅛″
Vertical motion of table under centre of spindle...	15¾″
Distance from centre of spindle to overhanging arm	5⅛″
Diameter of cutter arbor	⅝″
⅝″ Hollow spindle has Morse taper	No. 3
Number of spindle speeds	4
Number of feeds of table	6
Number and width of T slots of table	3″ × 9/16″
Number and width of steps on cone pulley ...	4″ × 2 5/16″
Diameter of steps	8″, 6¾″, 5⅛″, 4⅜″
Diameter of front spindle bearing	2″—1⅝″
Diameter of overhanging arm	2⅜″
Revolutions of countershaft	200 r.p.m.
Floor space required	47½″ × 63″
Weight of machine with countershaft (approx.) ...	880 lbs.

Price ... ... £50 8 0.

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MILLING MACHINE.

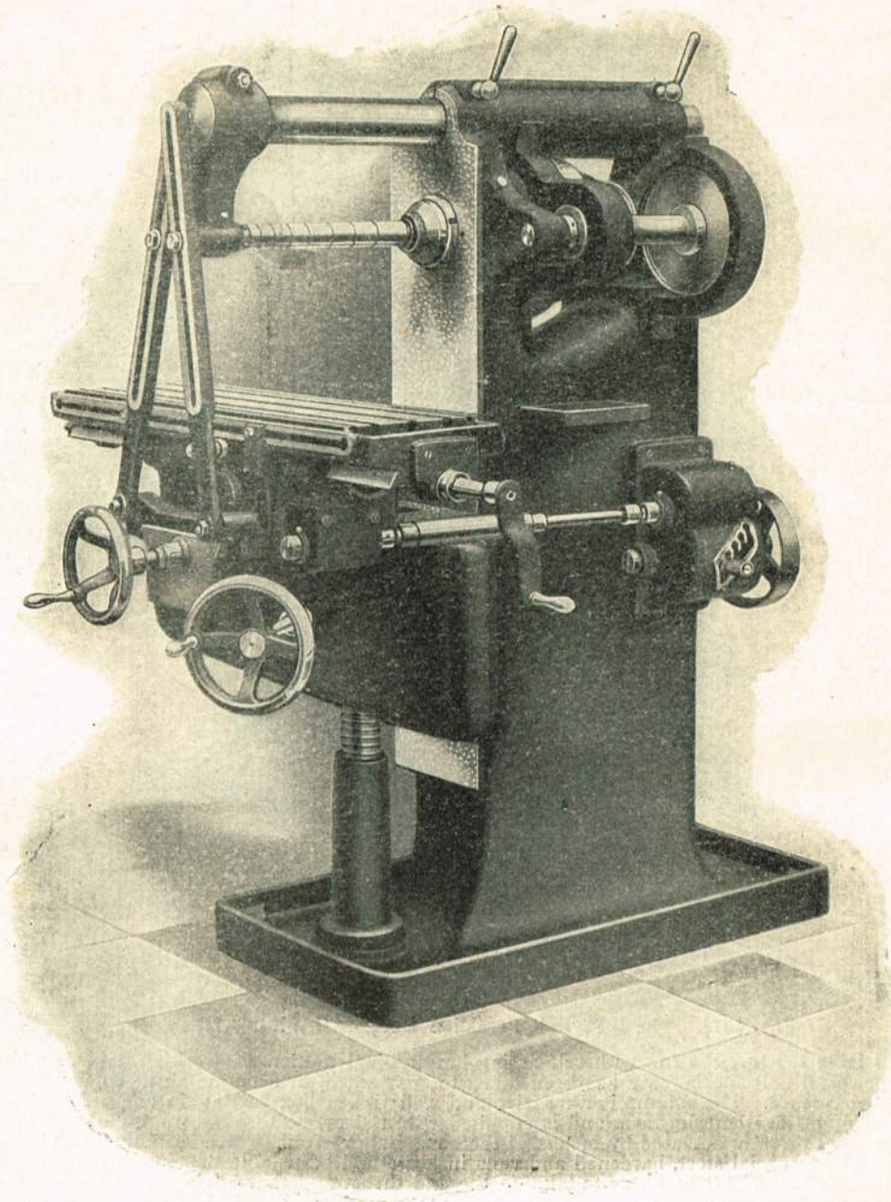

Fig. 6079. THE "MELBOURNE" PRECISION HORIZONTAL MILLING MACHINE.

Working Surface of Table, 29½″ × 9½″, with Self-acting Longitudinal Motion of working table and Gear Box allowing for quick change of 10 different speeds.

The Construction of this Machine is extremely powerful and special care has been taken to guarantee work of the highest degree of accuracy, so that the machine can be recommended with every confidence.

The Column is a massive and well-ribbed box casting in one piece with the base. Its upper portion carries the spindle and overhanging arm and is supplied with a door, so that the inner part can be used as a cabinet for tools and cutters.

The Main Drive is actuated by means of the cone pulley. The back gear allows the three speeds of the cone pulley to be doubled.

The Hollow Spindle is made of best special steel, hardened, and runs in large and adjustable dust-proof phosphor bronze bushes. It is carefully ground and provided with ball bearings to take up the end thrust and tapered inside to receive the cutter arbor, which latter is secured at the rear end by means of a draw-in attachment.

See next page for full specification and prices.

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MILLING MACHINE.

Complete Specification of Fig. 6079

THE "MELBOURNE" PRECISION HORIZONTAL MILLING MACHINE.

Working surface of table, $29\frac{1}{2}'' \times 9\frac{1}{2}''$.

With self-acting longitudinal motion of working table and gear box, allowing for a quick change of 10 different speeds.

Working surface of table	$29\frac{1}{2}'' \times 9\frac{1}{2}''$
Self-acting longitudinal feed of tables	$25\frac{1}{2}''$
Cross movement of table	$9\frac{7}{8}''$
Vertical motion of table under centre of spindle	$17\frac{3}{4}''$
Distance from centre of spindle to overhanging arm	$6\frac{7}{8}''$
Diameter of spindle nose	$1\frac{13}{16}''$
$\frac{5}{8}''$ hollow spindle has Morse taper No.	3
Number of spindle speeds	6
Number of feeds of table	10
Number and width of T-slots of table	$3'' \times \frac{9}{16}''$
Number and width of steps on cone pulley	$3'' \times 2\frac{1}{2}''$
Diameter of steps	$5\frac{1}{2}''$, $7\frac{1}{2}''$, $9\frac{1}{2}''$
Diameter of front spindle bearing	$1\frac{11}{16}''$—$2\frac{1}{16}''$
Diameter of overhanging arm	3"
Revolutions of countershaft	180 r.p.m.
Floor space	$79'' \times 59''$
Weight of machine with countershaft, nett approx.	1750 lbs.
Price	**£79 4 0**

Accessories supplied with each Machine—

One countershaft with oil-ring bearings. One set of nut keys and hand wheels. One cutter arbor, $\frac{7}{8}''$.

At a small extra cost the following parts can be supplied—

One vertical milling attachment :
Distance from column, $9\frac{1}{8}''$. **£10 16 0**
Morse taper No. 3.

One swivelling machine vice :
Width of jaws, $5\frac{1}{8}''$. **£4 4 0**

Oil pump and tank, **£8 0 0**

The Table is of very heavy design, so that there is no deflection when clamping working pieces. It has automatic longitudinal motions in both directions, with automatic release. The working surface is provided with three T-slots and oil channel,

The gear box gives the machine the following ten feeds :

0.15 0.18 0.20 0.24 0.31 0.62 0.72 0.83 0.99 1.25

The Knee carrying the table has large slides for the cross movement of table, and all motions are covered in order to prevent filings or dust from getting into the inner working parts. The screw of the vertical motion is constructed telescopical. No hole in the floor is wanted. Ball bearings supplied. The whole of the knee is so strong that it will prevent the table from any vibration. All spindles are graduated.

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MILLING MACHINE.

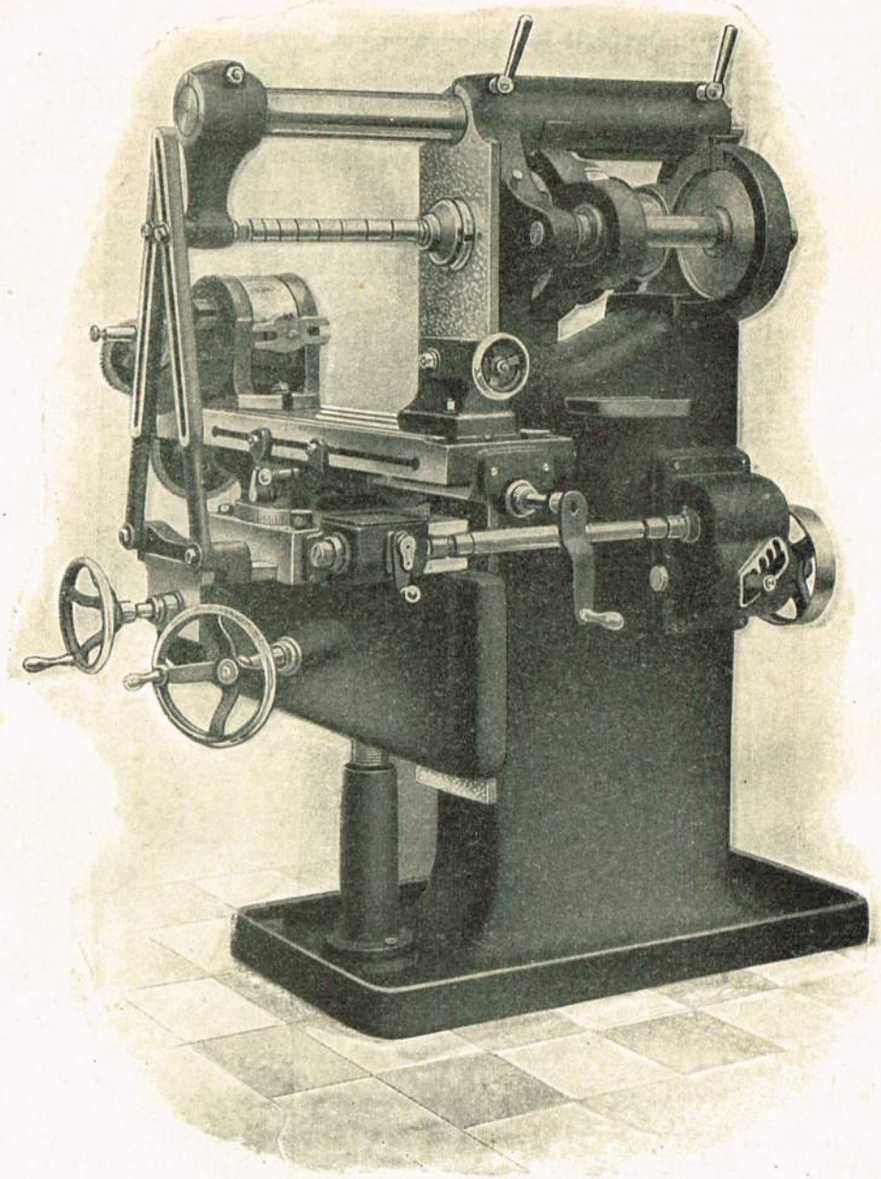

Fig. 6080. THE "KIMBERLEY" PRECISION UNIVERSAL MILLING MACHINE.

Working surface of table, $31\frac{1}{2}'' \times 8\frac{1}{4}''$.

With Self-acting Longitudinal and Cross Motion of working table, and Gear Box allowing for quick change of 10 different speeds. With Universal Dividing Head.

The Construction of this Machine is extremely powerful and special care has been taken to guarantee accurate work, so that the machine can be recommended with every confidence.

The Column is a massive and well-ribbed box casting in one piece with the base. Its upper portion carries the spindle and overhanging arm and is supplied with a door, so that the inner part can be used as a cabinet for tools and cutters.

The Main Drive is effected by means of the cone pulley. By a back gear six different speeds are obtained, and by a second drive from the countershaft these six speeds can be doubled.

The Hollow Spindle is made of best special steel, hardened, and runs in large and adjustable dust-proof phosphor bronze bushes. It is carefully ground and provided with ball bearings to take up the end thrust, and tapered inside to receive the cutter arbor, which latter is secured at the rear end by means of a draw-in attachment

See next page for full specification and prices.

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MILLING MACHINE.

Complete Specification of Fig. 6080.

"KIMBERLEY" MILLING MACHINE.

Working surface of table, $31\frac{1}{2}'' \times 8\frac{1}{4}''$.

With self-acting longitudinal and cross-motion of working table and gear box, allowing for quick change of 10 different speeds. With Universal Dividing Head.

Working surface of table	$31\frac{1}{2}'' \times 8\frac{1}{4}''$
Self-acting longitudinal feed of table	$23\frac{1}{2}''$
Self-acting cross movement of table	$9''$
Vertical motion of table under centre of spindle	$17\frac{3}{4}''$
Distance from centre of spindle to overhanging arm	$6\frac{7}{8}''$
Diameter of spindle nose	$1^{13}/_{16}''$
$\frac{5}{8}''$ hollow spindle has Morse taper	No. 3
Number of spindle speeds	6
Number of feeds of table	10
Number and widths of T-slots of table	$3'' \times {}^{9}/_{16}''$
Number and width of steps on cone pulley	$3'' \times 2\frac{1}{2}''$
Diameters of steps	$5\frac{1}{2}''$, $7\frac{1}{2}''$, $9\frac{1}{2}''$
Diameter of front spindle bearing	$1^{11}/_{16}''$—$2^{1}/_{16}''$
Diameter of overhanging arm	$3''$
Height of centre of Universal Dividing Head	$4\frac{3}{4}''$
Greatest admit between centres of Universal Dividing head and tailstock	$14\frac{3}{4}''$
Revolutions of countershaft	180 r.p.m.
Floor space required	$79'' \times 59''$
Weight of machine with countershaft, nett approx.	2000 lbs.

Price, £118 16 0.

Accessories supplied with each Machine—

One countershaft for two speeds, with oil-ring bearings ; one cutter arbor, $\frac{7}{8}''$; one set of keys and hand wheels ; one Universal dividing head for differential dividing ; one tailstock ; two dividing plates ; one set of change wheels and the necessary table.

At a small extra cost the following parts can be supplied—

One vertical milling attachment : Distance from column, $9\frac{1}{8}''$. Morse taper No. 3. } **£10 16 0.**

One swivelling machine vice : Width of jaws, $5\frac{1}{8}''$. } **£4 4 0**

Oil pump and tank, **£8 8 0.**

The Table is of very heavy design so that there is no deflection when clamping working pieces. It can be swivelled to any angle on the graduated base and has self-acting longitudinal and cross motion in both directions, with automatic release. The working surface is provided with three T-slots and oil channel.

The Gear Box gives the machine the following 10 feeds :

0.15 0.18 0.20 0.24 0.31 0.62 0.72 0.83 0.99 1.25

The Knee carrying the table has large slides for the cross movement of table and all motions are covered in order to prevent filings or dust from getting into the inner working parts. The screw for the vertical motion is constructed telescopical No hole in the floor is wanted. Ball bearings supplied.

The swivelling base is held by four screws, thus preventing the table from vibration. A reversing gear is provided to change the motion of the table. All spindles are guaranted.

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SAW BENCHES, GUARDS, Etc.

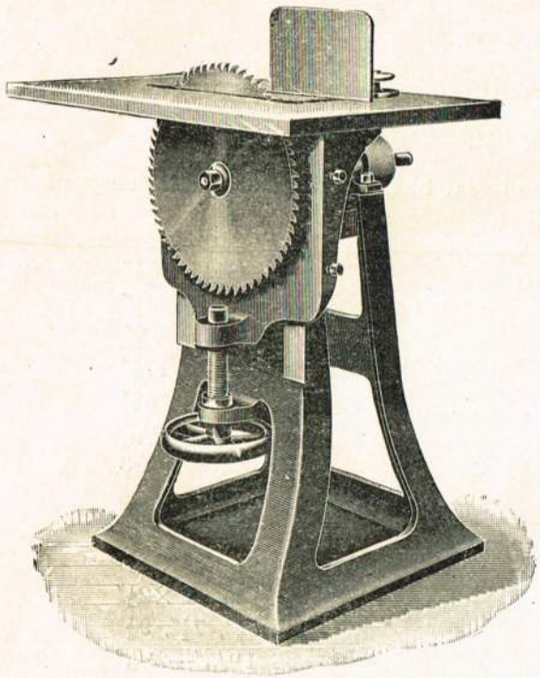

Fig. 6200.

SMALL SAW BENCHES FOR HAND OR POWER.

Will be found most suitable for cabinet makers, pattern makers, or for light work. It has screw adjustment.

SIZES AND PRICES.

STANDARD SIZES.	Size W.F. 1. Fitted with 14″ saw	Size W.F. 2. Fitted with 18″ saw	Size W. F. 3. Fitted with 22″ saw
Price	**£16 10 0**	**£18 0 0**	**£20 0 0**
Size of table	24″×16″	30″×20″	36″×20″
Diameter of saw included ...	14″	18″	22″
Will take saw up to ...	14″	18″	22″
Depth cut with largest saw	4″	6″	8″
Diameter and width of pulleys	5″×3″	5″×3″	5″×3″
Loose pulley and belt shifter extra	**£1 0 0**	**£1 5 0**	**£1 10 0**
Fly wheel, handle and stand, for hand power, extra ...	**£3 0 0**	**£3 0 0**	**£3 0 0**
Speed—revolutions per minute	2,000	1,600	1,280
Average brake horse-power required	1½	2¼ to 3	2¼ to 4

WOOD-TURNING LATHES, for Power.

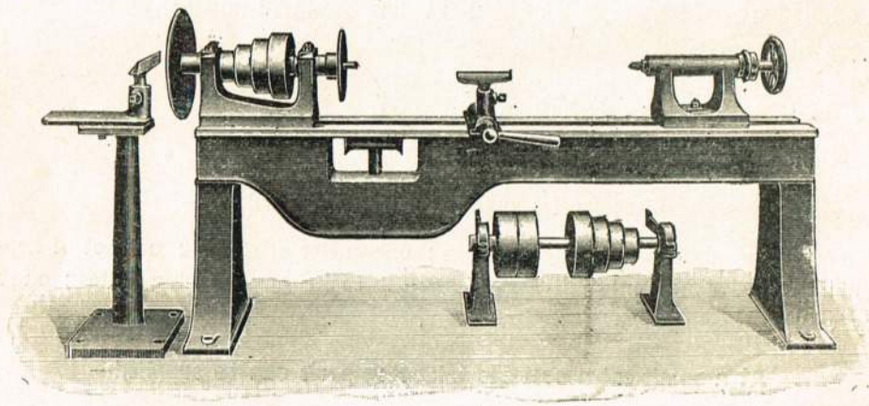

Fig. 6201.

The Lathe, with its component parts, forms a most complete but cheap equipment for the builder, wheelwright, joiner or pattern maker.

The Bed is very massive, truly planed and scraped on face, sides, and edges, and is made in almost any length, with or without the gap.

The Headstocks are fitted with either cone or equal pulleys ; the Spindle is of steel and runs in gun-metal bearings of ample proportions.

The rests are of a simple type, firm and efficient ; the Poppet is fitted with a square threaded screw and clamping arrangement.

The Lathes, as listed, are sent out complete, ready for use, fitted with fast and loose headstocks, countershaft with pulleys, hangers, etc., and belt striking gear, adjustable tee rest, fork, screw and dead centres.

SIZES AND PRICES.

No.	Height of centres Inches	Length of bed Feet	Length will turn Ft. Ins.	Diameter of pulleys on countershaft Ins.	Revs. per minute of countershaft	Price
1	6	6	3 8	6	800	**£31 10 0**
2	8	8	4 11	8	600	**£42 10 0**
3	9	10	6 7	10	500	**£58 10 0**

Extra length of bed, per foot ... ... **£2 2 6** extra.

Extra if fitted with large face plate, pillar stand and tee rest, for turning large diameters ... ... **£7 10 0** ,,

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SAW BENCHES.

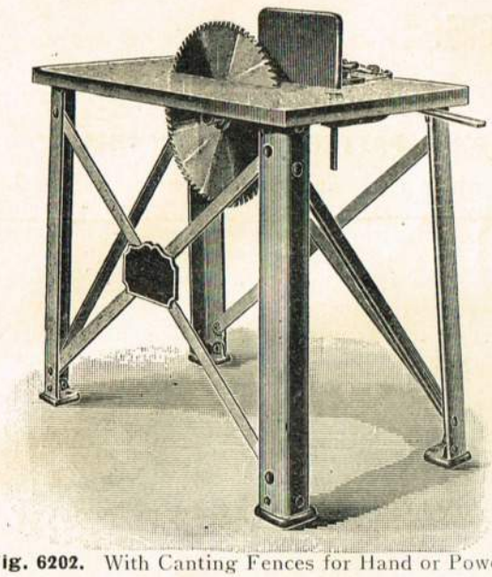

Fig. 6202. With Canting Fences for Hand or Power.

These light pattern Benches are made to suit the requirements of small users, and are especially suitable for cross-cutting, as the pulleys do not project above the top of the table.

The Fence is adjustable for cutting any thickness or for bevel work, and can easily be removed for cross-cutting.

The Spindle is steel, and runs in adjustable gun-metal bearings.

The legs are of steel and firmly braced, making the frame very rigid when in use.

For export these benches can be readily packed, and take very little space.

The table and fence plate are planed.

PRICES AND SIZES.

Standard Sizes	Size No. W1 Fitted with 14″ saw.	Size No. W2 Fitted with 18″ saw.	Size No. W3, Fitted with 22″ saw.
Price	**£9 0 0**	**£10 5 0**	**£12 0 0**
Size of table	24″×16″	30″×20″	36″×20″
Diameter of saw included	14″	18″	22″
Will take saw up to	14″	18″	22″
Depth cut with largest saw	4″	6″	8″
Diameter and width of pulleys	5″×3″	5″×3″	5″×3″
Loose pulley and belt shifter extra	**£1 0 0**	**£1 5 0**	**£1 10 0**
Fly wheel, handle and stand, for hand power, extra	**£3 0 0**	**£3 0 0**	**£3 0 0**
Saw guard, extra			
Speed revolutions per minute	1,200 to 2,000	1,000 to 1,600	800 to 1,280
Average brake horse power required	1½	2¼ to 3	2¼ to 4

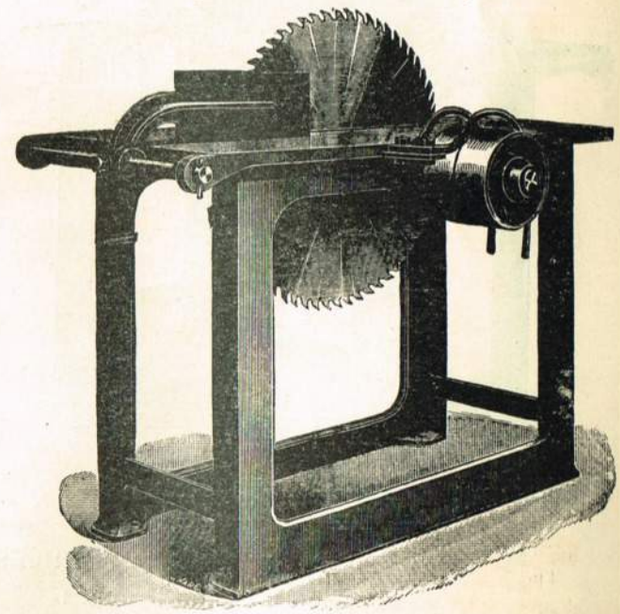

Fig. 6203. SAW BENCHES.

These Benches are made to supply a demand for light work, cross-cutting, etc. They are well fitted and have a sliding fence and planed top, which is a most important point, as if the table is not quite true, it does bad work, and also causes the saw to buckle, which means endless expense getting it put right. They are fitted with long gun-metal bearings and strong frame, which keep it perfectly rigid. The sizes given are approximate only.

If either of the above benches required without loose pulley and belt shifter	**10**/– less
If either of the above benches required without fence	**5**/– less
If benches required with ball bearings instead of gun-metal	**20**/–extra

SIZES AND PRICES.

Standard Sizes	Size No. E1.	Size No. E2.	Size No. E3.
Size of table	36″×18″	42″×20″	48″×24″
Take saw of diameter	18″	22″	24″
Maximum depth of cut	6½″	8½″	10″
Diameter and width of pulleys	6″×3″	7″×3″	7″×3″
Prices, including saw, fence, fast and loose pulleys, and belt shifter	**£8 10 0**	**£10 0 0**	**£11 0 0**
Speed revolutions per minute	1,000 to 1,600	800 to 1,280	800 to 1,200
Average brake horse power required	2¼ to 3	2¼ to 4	3 to 4½

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SAW BENCHES.

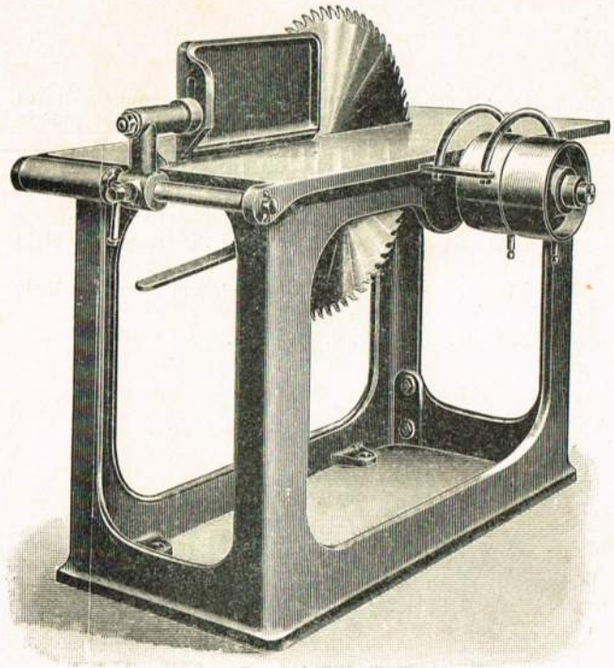

Fig. 6204.

MEDIUM PATTERN SAW BENCHES.

This Bench is made in one size only, and has been brought out by us to meet the demand for a cheap, reliable article, suitable for farm and general work. The spindles are of steel, and work in long gun-metal bearings. The table is accurately planed and mounted on strong cast frame. The planed fence can quickly be adjusted for cutting timber of any required thickness, and turned back when necessary for cross-cutting. It also can be set for bevel-cutting. A sleeve roller is fitted in front of bench to facilitate moving the timber. Right-hand benches (as illustrated) always supplied unless specially ordered otherwise.

STANDARD SIZE.	Size 0. Fitted with 24″ saw.
Size of table	45″×21″
Includes saw	24″
Maximum depth cut	10″
Diameter and width of pulleys	7″×3″
Price, including saw	**£14 5 0**
Loose pulley and belt shifter extra	**£0 19 0**
Saw guard extra	**£3 15 0**
Speed revolutions per minute	800 to 1,200
Average brake horse-power required	3 to 4½

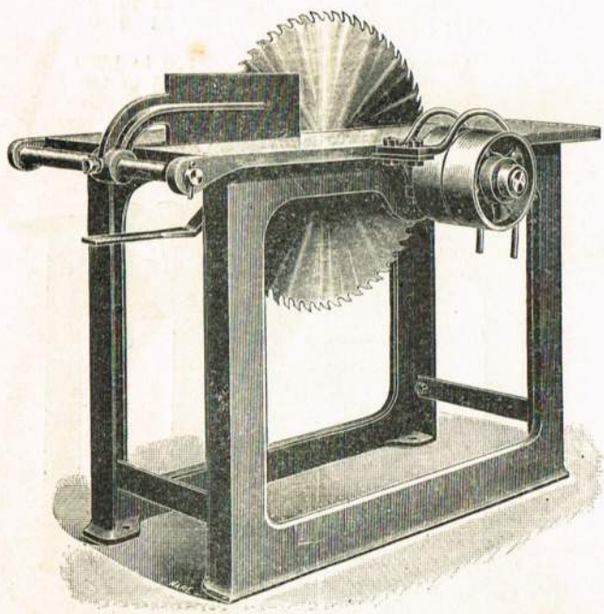

Fig. 6205

These Benches are of new design, and are made in five sizes. The tables are accurately planed and mounted on strong cast iron frames, thereby insuring rigidity when in work. The spindles are of steel, and work in long gun-metal bearings. The planed fence can quickly be adjusted for cutting timber of any thickness, and turned back when necessary for cross cutting. It also has a canting motion. A sleeve roller is fitted in front of the bench to facilitate moving heavy timber. Right-hand benches (as illustrated) always supplied unless specially ordered otherwise. Prices include saw to dimensions given.

PRICES AND SIZES.

STANDARD SIZES.	No. 1a Fitted with 24″ saw	No. 1b Fitted with 26″ saw	No. 2b Fitted with 30″ saw	No. 2a Fitted with 30″ saw	No. 2c Fitted with 36″ saw
Size of table	48″×24″	54″×26″	60″×28″	60″×28″	66″×28″
Take saw of diameter	30″	36″	36″	36″	42″
Maximum depth of cut	13″	16″	16″	16″	19″
Diameter and width of pulleys	8″×4″	8″×4″	8″×4½″	8″×4½″	8″×4½″
Prices, including saw	**£17 16 3**	**£20 18 0**	**£23 15 0**	**£27 1 6**	**£32 15 0**
Loose pulley and belt shifter, extra ...	**£1 3 9**	**£1 8 6**	**£1 8 6**	**£1 8 6**	**£1 8 6**
Boring apparatus extra	**£5 0 0**	**£5 0 0**	**£6 0 0**	**£6 0 0**	**£6 0 0**
Speed-revolutions per minute	800 to 1,200	700 to 1,100	650 to 940	650 to 940	800
Average brake horse-power required ...	4 to 6	5 to 7½	6 to 8	6 to 8	8

Travelling Fence for tennoning to either of the above benches, **£8 10 0** extra.

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SAW BENCHES AND SPINDLES.

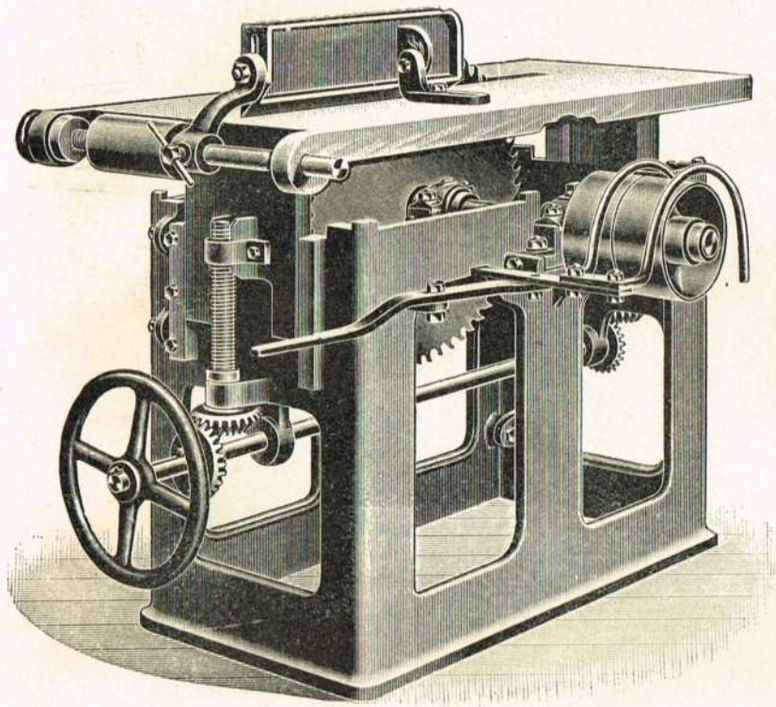

Fig. 6206.

CIRCULAR SAW BENCH

with Rising and Falling Table.

These benches are constructed for constant and accurate work, tongueing, grooving, rebating, cross-cutting, as well as for ordinary sawing, and are great labour savers in saw mills, joineries, and furniture manufactories.

The rising table benches are fast superseding those with the rising spindle, as they take up less room, can be fixed in any position, and the driving belt being always at one tension.

The tables are truly planed, and supported upon heavy end pieces, which rise between planed adjustable vee slides, and are worked by steel square-threaded screws in gun-metal nuts, the screws being operated by mitre gear from a shaft and hand wheel, which can be placed at either end.

The saw spindles are of steel, and work in two long adjustable gun-metal, dust-proof, self-oiling bearings, and the bearings, being adjustable horizontally, and metal to metal everywhere, great rigidity is given to the saws.

The fences are of the adjustable, canting type, and can be adjusted both by hand, and by a square threaded screw for fine adjustment; the fence plates having end steadiment for fixing the plates in any position, giving great rigidity.

The vertical rise of the tables is about 8″.

Additional jigs for the rapid production of work, such as spindles, to carry two or more saws, wobbling saws for wide grooving, etc., can be quoted for, if particulars are given.

PRICES AND SIZES.

STANDARD SIZES.	No. 1F Fitted with 24″ saw	No. 2F Fitted with 30″ saw
Size of table	48″ × 24″	60″ × 28″
Take saw of diameter	30″	36″
Maximum depth of cut	13″	16″
Diameter and width of pulleys	8″ × 4″	8″ × 4½″
Prices, including saw	**£34 0 0**	**£46 0 0**
Loose pulley and belt shifter, extra	**£1 5 0**	**£1 10 0**
Boring apparatus extra	**£6 0 0**	**£6 0 0**
Speed revolutions per minute	1200	940
Average brake horse-power required	4 to 6	6 to 8
Travelling Fence for tenoning to either of the above benches	**£8 10 0** extra.	

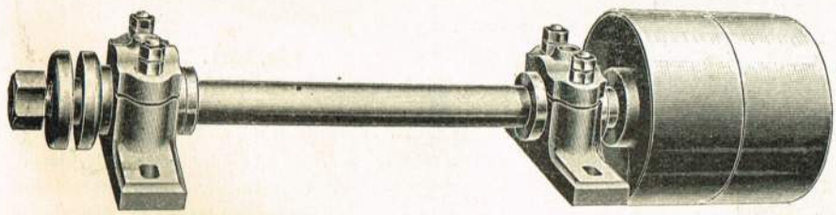

Fig. 6207.

STEEL SAW SPINDLES

with Heavy Plummer Blocks.

Diam. of spindle, inches	Size of pulleys inches	Price each
1¼	9 × 4	**£3 10 0**
1½	10 × 5	**£4 7 6**
1¾	12 × 5	**£5 2 6**
2	12 × 6	**£5 12 6**
2¼	14 × 6	**£7 0 0**
2½	16 × 6	**£8 10 0**

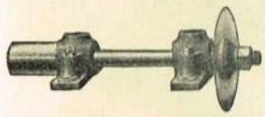

Fig. 6208. Saw Spindle.
Light model makers.

	With Fast Pulley.				With Fast and Loose Pulleys.			
Size	1	2	3	4	5	6	7	8
Diameter of spindle at saw end inches	1	1⅛	1¼	1½	1	1⅛	1¼	1½
Price	**38/6**	**49/–**	**69/–**	**79/9**	**43/3**	**55/6**	**81/6**	**94/–**

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PLANING AND THICKNESSING MACHINES.

Fig. 6210.

IMPROVED PLANING AND THICKNESSING MACHINE.

Made in two sizes, 9″ and 12″.

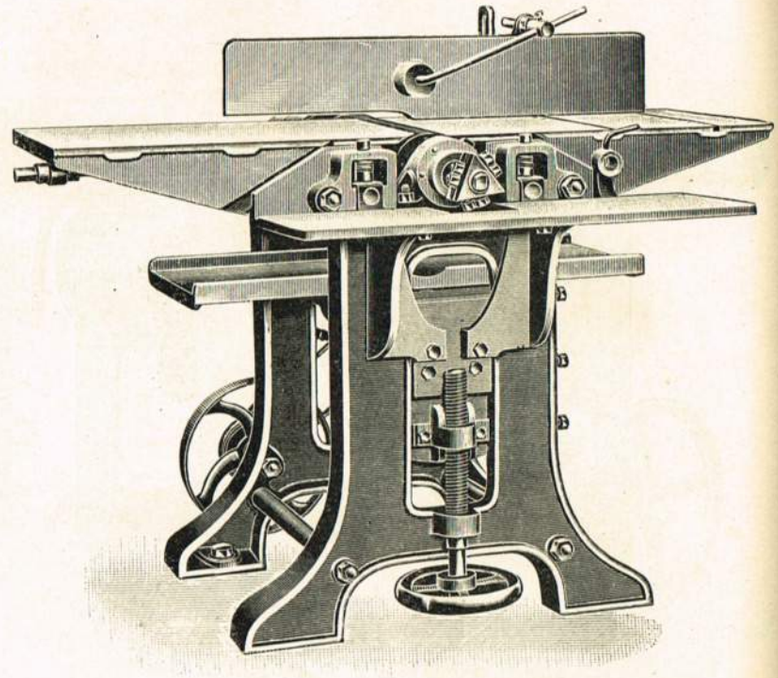
The former has capacity for surfacing material 9″ wide to a thickness of 7″, and the latter will surface 12″ wide to a thickness of 7″.

The machine is substantially proportioned, the frames being heavy, well ribbed and strongly connected by rails.

The tables are long and planed perfectly true, the bottom one being raised and lowered by means of a square thread screw operated by a hand wheel. This table cannot come in contact with the knives, and has a raised lip on either side which greatly facilitates the feeding of short pieces, as it prevents them from turning around or cornering. The top tables have independent adjustment, making the machine suitable for joinery of all descriptions.

The cutter block is of the safety circular type, with three knives, and revolves in dustproof housings fitted with ball bearings.

There are three speeds to the feed rollers, which are driven by a 12″ × 2″ pulley running at 200 r.p.m., and as the pressure of the rollers can be regulated, the marking of material is practically eliminated.



The outside block and side table shewn in the illustration is a useful addition at slight extra cost, as tonguing, grooving, rebating and beading can be done with this attachment, and other uses will suggest themselves.

Cutters are inexpensive and easily affixed to the block by means of the bolts shewn, with obvious advantages.

	Sizes of Tables.	Size of pulley	Speed	Weight (without fence and moulding attachment)	List Price.
9 ins.	Top 12 ins. × 3 ft. 0 in. Bottom 9¼ ins. × 2 ft. 8 ins.	...6 ins. × 4 ins.	2,500 r.p.m.	7¼ cwt.	**£40 0 0**
12 ins.	Top 15 ins. × 3 ft. 0 ins. Bottom 12¼ ins. × 2 ft. 8 ins.	...6 ins. × 4 ins.	2,500 r.p.m.	8 cwt.	**£47 0 0**

Fence for above, extra	**£2 0 0**
Extra table, cutter block (knives extra) for jointing, moulding, etc.	**£4 10 0**
Countershaft, including 3 ft. × 1½ in. shaft, three 1½ in. collars, two 1½ in. S.O. blocks, 7 in. × 4 in. × 1½ in. pulleys, one 24 in. × 4 in. × 1½ in. pulley, and one 4 in. × 3 in. × 1½ in. pulley	**£5 0 0**

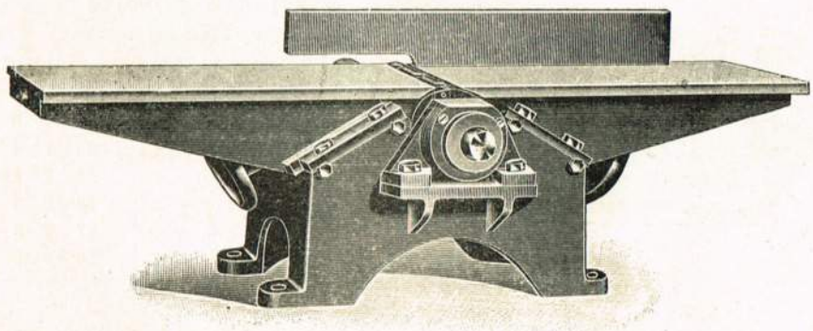


Fig. 6211.

SMALL WOOD. PLANER FOR BENCH.

Will plane up to 9″ wide, and suitable for joinery of all descriptions. Long tables, accurately planed, with independent adjustment. The cutter block is of Improved Safety Circular Type, fitted with three knives and mounted on ball bearings in dust-proof housings. Can be fitted either on bench or on pedestal.

Length of tables over all	Width of tables	Size of driving pulley	Speed of spindle	Weight of planer (without fence)	Horse power required.	Price (without fence)	Price (with fence).
3 ft. 8 ins.	9¾ ins.	3½ ins. × 3 ins.	2500/3000 r.p.m.	2 cwt.	2	**£23 0 0**	**£25 0 0**

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PLANING AND THICKNESSING MACHINE.

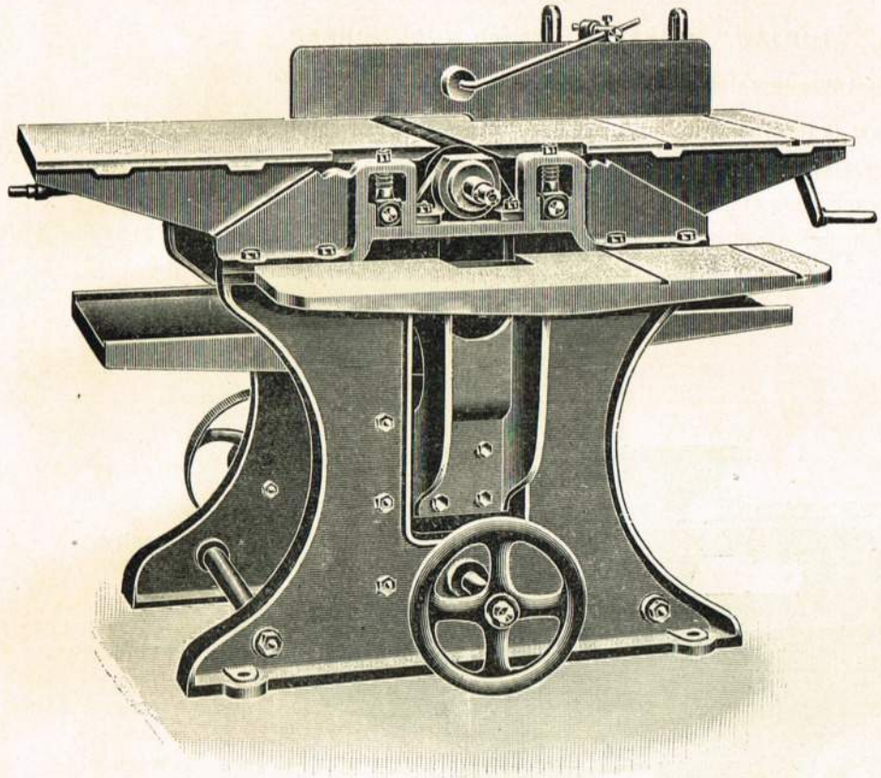

Fig. 6212.

18″ PLANING AND THICKNESSING MACHINE

Exceptionally heavy design. Vibration is reduced to a minimum. Material up to 18″ can be surfaced and thicknessed up to 8″

The attachment for moulding, etc., (extra block and side table), is extra. Cutters for tonguing and grooving, etc., can be supplied.

Sizes of tables	Size of pulley	Speed	Weight (complete with fence and moulding attachment)	Price (without fence and moulding attachment)
Top—4 ft. 8½ in. long overall × 22 in. wide. Bottom, 4ft. 0in. × 8¼in.	6 in. × 4 in.	2,500 r.p.m.	14 cwt.	**£60 0 0**
Fence for above, extra				**£2 10 0**
Extra table, cutter block (knives extra) for jointing, moulding, etc.				**£5 12 6**
Countershaft, including 3 ft. × 1½ in. shaft, three 1½ in. collars, two 1½ in. S.O. blocks, 7 in. × 4 in. × 1½ in. pulleys, one 24 in. × 4 in. × 1½ in. pulley and one 4 in. × 3 in. × 1½ in. pulley				**£5 0 0**

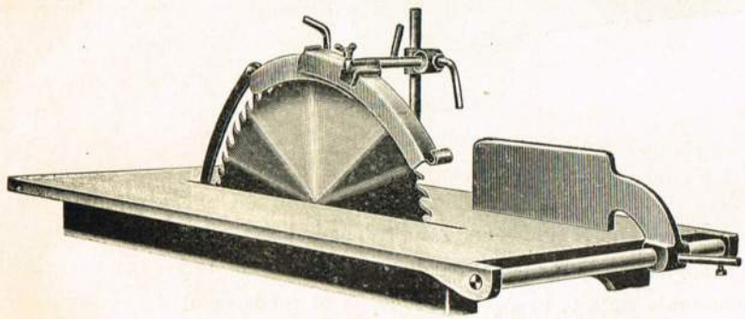

Fig. 6213. SAW GUARD.

This is a medium pattern Saw Guard, complete with riving knife, designed for saws up to 30″ diameter.

The front of the guard is securely locked in any position by means of a wing nut, and the horizontal and vertical supports are easily adjusted by lever screws; spanners are thus unnecessary.

PRICES.

For saws up to 18″	... ...	**£2 0 0**
,, ,, 24″	... ...	**£2 0 0**
,, ,, 30″	... ...	**£2 2 6**

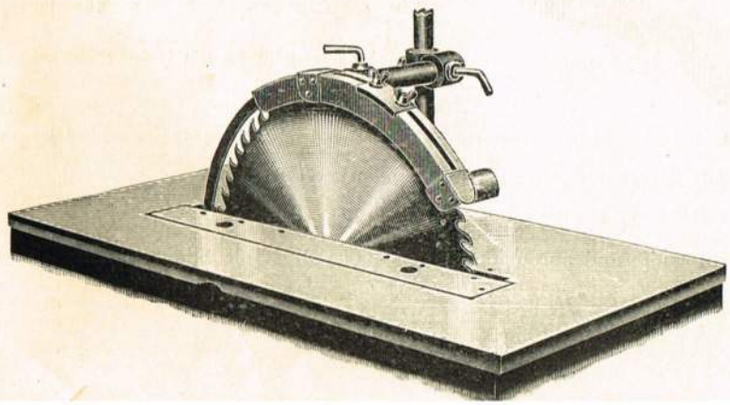

Fig. 6214. SAW GUARD.

A heavier pattern Saw Guard than illustrated above; made in a wider range of sizes to suit saws from 18″ up to 48″ diameter.

All adjustments easily and quickly effected without the use of spanners.

PRICES.

For saws up to 18″	... ...	**£3 15 0**
,, ,, 24″	... ...	**£3 15 0**
,, ,, 30″	... ...	**£3 15 0**
,, ,, 36″	... ...	**£3 15 0**
,, ,, 42″	... ...	**£4 2 0**
,, ,, 48″	... ...	**£4 10 0**

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WOODWORKING MACHINES.

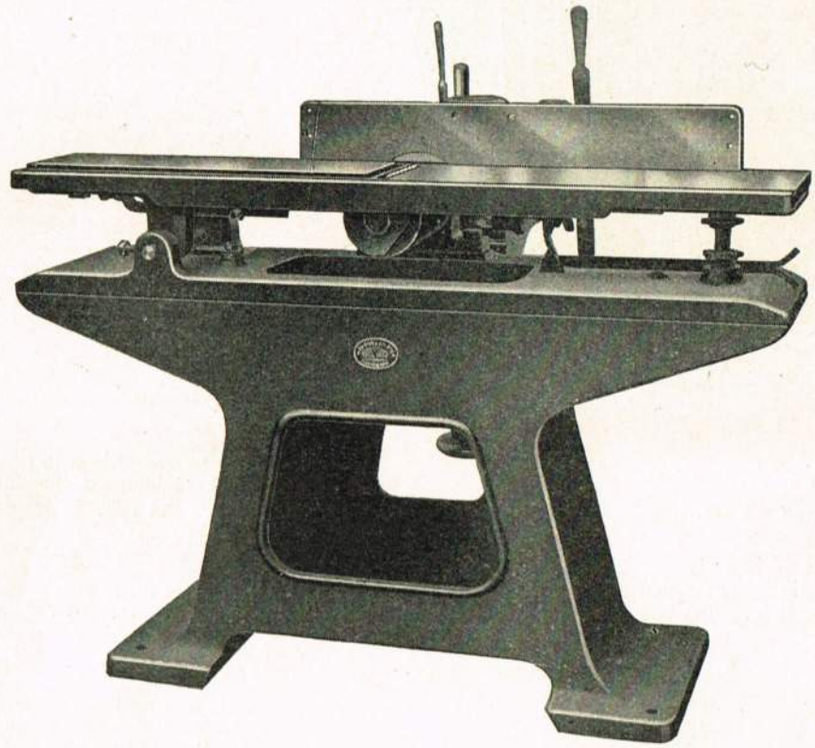
Fig. 6230. "MIDSAW" UNIVERSAL (Patent) WOODWORKER.

"The Greatest Woodworking Machinery Invention of this Generation."

The "Midsaw" Universal Woodworker (6 inch) does the work of five machines, viz., **Sawbench, Planer and Jointer, Moulding Machine, Boring and Drilling Machine, and Morticer.** Unlike single-purpose machines the **"Midsaw"** is a constant producer. In the average shop many single-purpose machines stand idle for hours every day. The **"Midsaw"** displaces (or supplements) these machines at a fraction of their combined cost and is always producing, therefore, always earning profit. It is also a good stand-by machine in big shops to take up surplus work of five other machines. No worker in wood can **afford** to be without this machine.

WHAT IT DOES.

Sawing,
Planing,
Jointing,
Moulding,
Boring,
Drilling,
Morticing,
Tenoning,
Corner Locking,
Bevelling,
Beading,
Mitreing,
Tapering,
Half Lapping,
Thicknessing,
Tongueing,
Stair Stringing,
Etc., Etc.



WHAT IT SAVES.

Capital,
Power,
Space,
Time,
Handwork of Highly Paid, Highly Skilled Labour,
Waste of Material.

Equals the Output of Eight Men at a power cost of 3d. per hour.

Set up for planing and jointing.
Note.—Rear Slide raised for depth of cut.

The changing of the machine from one operation to another is quite simple and can be done in less than a minute. The table works on the hinge pin for lateral adjustment; the fence is adjustable on the table, and distance washers can be used on the spindle, thus giving **three distinct adjustments** to enable **fine and accurate work** to be done. The depth of cut is regulated by the raising screw at the front of the machine.

It has the merit of simplicity; it is easily understood; there is nothing readily liable to go wrong and such is its rigidity and weight that it runs smoothly and solidly without vibration.

The machine is fitted with a **Safety Circular Cutterblock** for planing. Cutterblocks are fitted with the "Quickset" (Patent) Adjusting Stud. The knives cannot slip out. This is easily detachable when sawing and other operations are required. The setting of the blades in the circular cutterblock is not affected when removed from the machine.

GUARDS.—The guards include Saw Guard with riving knife and apron for underneath; Adjustable Sliding Planer Guard and Thicknessing Cutterblock Guard.

These are designed to meet the requirements of the Home Office Regulations.

Full specification and prices continued on next page.

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WOODWORKING MACHINES.

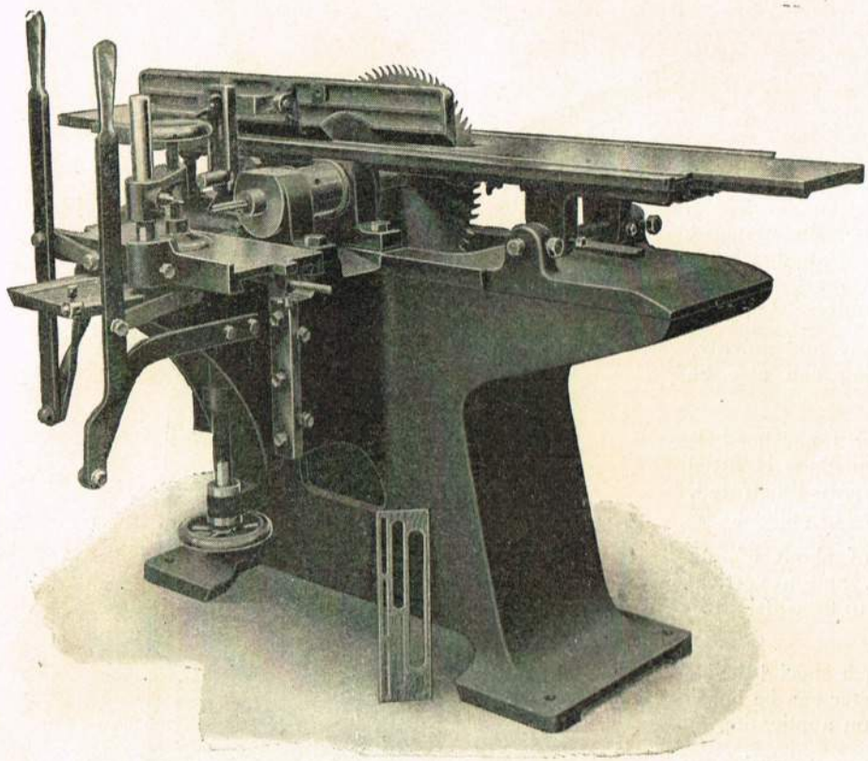

Fig. 6230.

The "MIDSAW" UNIVERSAL WOODWORKER manufactures woodwork on engineering principles; it eliminates that great bulk of hand labour now done on the bench, and produces wood components, however intricate, by sure, simple, and foolproof mechanical means. It is the result of years of experience in Sawmill Engineering. Highly specialised knowledge has produced it, and its reception by the woodworking industry proves that it has met a hitherto unsatisfied demand. Moreover, it is a perfect product of the Engineer's Art.—**"It runs like a watch."**

The Spindle is of the best quality steel, accurately ground and mounted in **Skefko Patent Self-aligning Ball Bearings,** running in dust-proof grease-packed housings.

The Spindle end is bored to take Boring Bit, and, as an extra, a Slot Morticing and Boring attachment can be fixed.

The Slides open out to admit the saw (14-inch); a wood gap plate is introduced and is lowered on to the revolving saw which gives the necessary saw gate.

The **table** is 4 feet long when planing and 5 ft. long when sawing.

Set up as Rip Saw Bench and shewing Slot Morticing and Boring Attachment.

The "**MIDSAW**" can be mounted on battens with an electric motor or oil engine which enables Builders, Contractors, etc., to move it from job to job, thus giving five machines on away jobs, which is a great boon and saves time, cartage of material, etc.

The Midsaw is the only machine on the market which will do the work we claim. It has solved the problem for the Builder, Estate Farms, Mills, Factories, etc. Write for fully illustrated booklet, with copy of guarantee offered.

Improved Double Mitre Fence and Dimension Apparatus.—The table has a groove on either side of the saw in which an Improved Double Mitre Fence and Dimension Apparatus works up to adjustable stops. The connecting rod can be removed, enabling the fences to be used independently. The front slide of the table is marked with a variety of angles, thus enabling the operator instantly to secure the angle required. All woodworking machinists will at once appreciate the great value of this attachment. It is only the double mitre fence on the market and has been received with much approval by the trade. Owing to the Mitre Fence being double-ended, square cross-cutting and dimension sawing can be performed with great facility and rapidity. Both fences are drilled to take wood fence jigs for cutting and mitreing mouldings, etc.

Size of Tables—	
Surfacing	48in. × 11in.
Thicknessing	27in. × 9in.
Sawing	60in. × 19in.
Slot Morticing (when supplied without Thicknessing Attachment)	15in. × 7in.
Height of Table	32in.
Maximum Diameter of Saw	14in.
Depth of Cut (Sawing)	4½in.

Planing and Moulding	6in.
Thicknessing	4½in.
Speed of Cutter Spindle	3,000 r.p.m.
Speed of Countershaft	900 r.p.m.
Size of Pulley	3in. × 3in.
Size of F. & L. Pulley on Countershaft	6in. × 3½in.
Power required	3 H.P.
Approximate Weights—Nett...	8 cwt.
Packed for shipment ...	10 cwt.
Approximate Shipping Measurements	33 cub. feet.

Equipment included with Complete Machine—

1 Circular Saw, 14in.
1 Circular Safety Cutterblock, fitted with "Qwikset" Patent Adjusting Studs, complete with 1 pair Super-ground, High-speed Knives for Surfacing.
1 Circular Safety Cutterblock, fitted with "Qwikset" Patent Adjusting Studs, complete with 1 pair Super-ground, High-speed Knives for Thicknessing.
1 pair Slotted Collars, fitted with Rebating Irons and Side Cutters.
1 Auxiliary Table.
1 Thicknessing Spindle with Guard, fitted with Spring Pressure Rollers.
1 Slot Mortising and Boring Attachment, and Slot Mortice Bit, ½in.
1 Improved Double Mitre Fence and Dimension Apparatus and Adjustable Stops.
1 Saw Guard complete with Riving Knife and Underneath Apron.
1 Adjustable Sliding Planer Guard.
1 Set Holding Down Springs.
Distance Washers.
Spanners, Key, Screwdriver and Tommy Bars.

PRICE ... **£87.**

The machine can be supplied without Thicknessing Attachment. Price, **£74.**
The machine can be supplied without Thicknessing and Slot Morticing and Boring Attachment. Price, **£57.**
If Countershaft complete with Striking Gear is required, extra. Price, **£6.**

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MORTISING & BORING MACHINE.

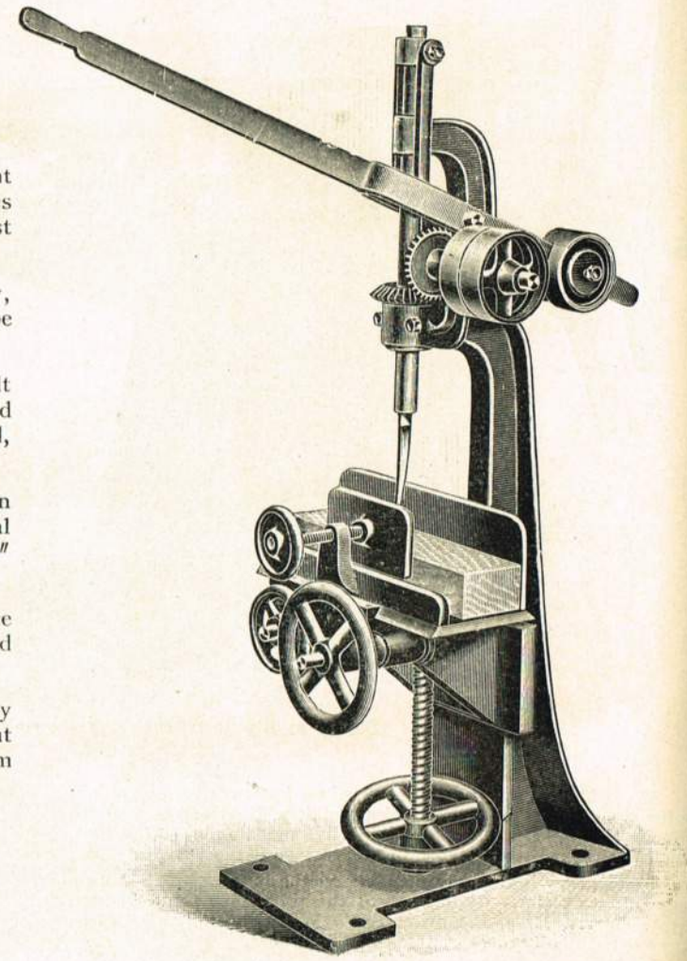

Fig. 6235.

In this machine the central position of the wrought iron lever ensures great power being obtained, and reduces wear and tear to a minimum, and the frame being cast in one piece gives great strength and firmness.

The chisel can be truly reversed, easily and quickly, and the change from mortising to boring can also be speedily effected.

The boring apparatus can be arranged for either belt or hand drive. In the former case the machine is fitted with a pair of 6″ × 2″ fast and loose pulleys, as illustrated, and in the latter a handle is supplied instead of pulleys.

The table has a lateral motion of about 6″, an effective longitudinal movement of 12″, and a vertical movement of 10″, and takes in timber up to 6″ wide × 15″ deep.

By removing the table and attaching a special device for holding them, wheel-stocks 12″ diameter can be bored and mortised. Price of this attachment on application.

The machine is well finished throughout, and very substantial—weight complete 4 cwts.—and is sent out with six chisels ($\frac{1}{4}$″, $\frac{5}{16}$″, $\frac{3}{8}$″, $\frac{1}{2}$″, $\frac{5}{8}$″, and $\frac{3}{4}$″) made from high-class steel.

Price complete ... **£20 0 0.**

MORTISING MACHINE.

Without Boring attachment **£17 10 0**

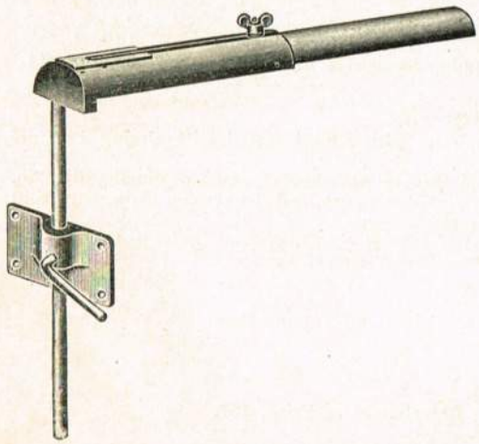

Fig. 6236.

GUARD FOR PLANING MACHINE.

Suitable for any machine up to 18″.

This guard, notwithstanding its low price, is quite reliable, as it affords perfect protection to the operator, and can be easily and quickly adjusted both vertically and horizontally.

The cover is made in two parts from stout steel plate (or brass sheet, if desired)—the sliding part being securely locked in position by means of the wing nut shewn.

The vertical support slides in a cast bracket which is fixed to the planer by set screws, and the guard can be quickly raised or lowered, or removed to allow full access to the cutter block.

PRICES:

With steel cover	**25/–**	each
With brass cover	**30/–**	,,

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MORTISING MACHINE.

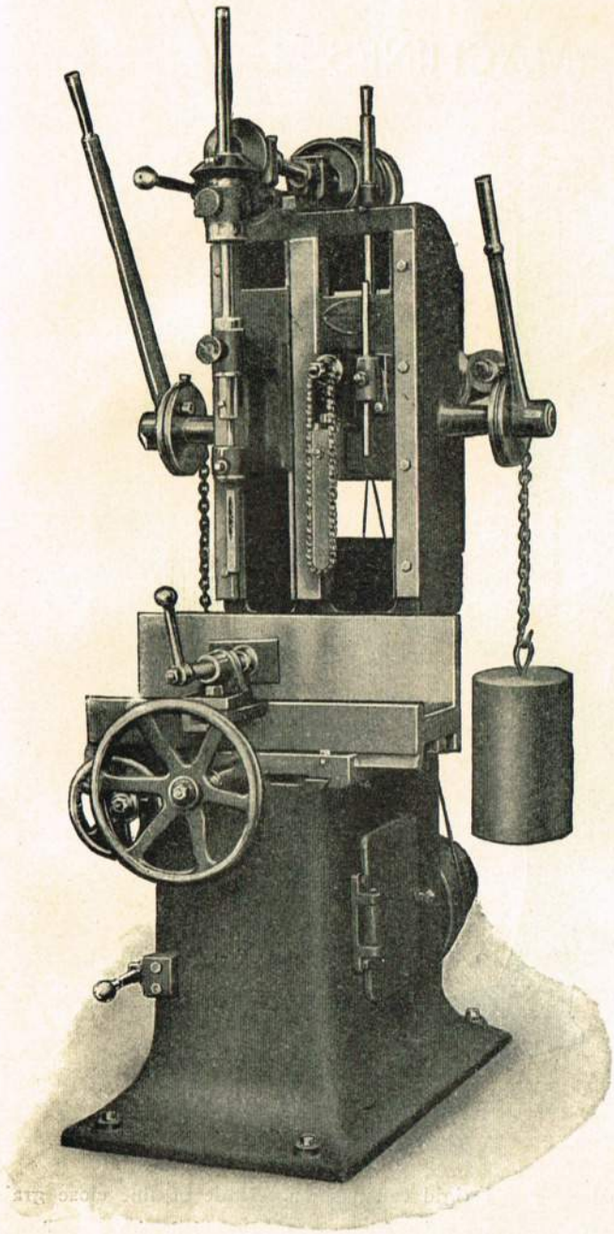

Fig. 6237. Chain and Hollow Chisel Mortising Machine.

With self-contained drive. Work admitted, 11″ × 9″, and will mortise up to 6½″ deep without reversing timber.

This Machine has been designed for chain and hollow chisel mortising in the first instance, and both chain and chisel parts are arranged for in the design of the whole, each unit being of equal importance. The mortiser is suitable for a very large range of mortising, and is equally suitable for either joiners and builders or shipbuilding and railway carriage and wagon work. The chain will mortise at one cut up to 1¼″ × 3″, or down to ¼″ × ⅞″. The chisel arrangement takes in chisels from ¼″ square up to 1″ square, and by slipping out the chisel this part of machine may be used for boring round holes.

The Body.—This is cast in two parts and is of the column type, fitted with cabinet cast inside and door complete.

The Table.—The horizontal traverse is by rack and pinion. The cross traverse movement of the table is operated by hand wheel and screw.

Timber.—This is immediately clamped or loosened by one half-turn of the handle, which operates a quick-lead screw.

Drive.—The drive is entirely self-contained. A countershaft is fitted in the base of the machine, and from this the drive is taken by belt to the chain mortiser spindle. There is also another separate belt which drives the hollow chisel arrangement. The action of the clutch is as follows: When the operator starts the machine by shipping over the main belt from loose pulley to tight pulley, the countershaft is started up and this drives the loose portion of the friction clutch. On bringing down the chain mortise head by the hand lever which is provided at the side of the machine, the stationary portion of the clutch is allowed to engage with the half which is revolving, the result being that the mortiser is immediately started up, the mortise is completed and on the chain ascending clear out of the timber the clutch is disengaged and the machine comes to rest immediately. This arrangement saves a great amount of wear of the tools, which is a very important matter in the upkeep of a chain mortiser, and also there is no risk of accident to the operator when changing the timber from one position to another, because the chain or chisel is stationary.

Driving Belt is fitted with a simple device for making allowance for the tension of the belt being kept equal in all positions of the stroke, so that this machine can be driven from any position which may be found convenient in the shop, and a small amount of floor space is taken up.

Chain Mortiser has a device for immediately taking up any slack which may develop in the driving belt. The chain slide is fitted with depth gauge for use when making blind mortises.

Hollow Chisel.—This side of the machine is fitted with an independent fast and loose pulley with separate belt fork, which is also controlled from the front, and this enables the hollow chisel to be put out of gear without having to push the belt off when the side of the machine is not being used.

Mortise Slides.—These are brought down to their work by independent levers, one at each side of the machine, and these levers work in a quadrant so that the height of the lever can be immediately adjusted to suit the convenience of the operator. When once set it is not necessary to alter these handles. Any depth of timber up to the maximum can be dealt with.

Mortise Chisel or Chain are returned to their original positions after completing a mortise by balance weights provided at each side of the machine.

Bearings.—Self-oiling, of best phosphor bronze of ample length and diameter.

Movements of machine.—Each mortise head travels 11½″ and will make a mortise up to 7″ deep at one stroke. Movement of table traversely 5″. Movement of table in a horizontal direction 24″. Largest piece of timber taken in 12″ × 9″. Speed of countershaft 925 revolutions per minute. Size of countershaft pulleys 8½″ for 2½″ belt.

Dimensions and Weight of machine.—Breadth of base, 1′ 10″. Extreme breadth, 2′ 8″. Distance through from front to back of base, including overhanging arm, 3′ 11″. Total distance over all, back to front, 5′ 4″. Height 6′. Nett weight about 14 cwts. Gross weight 16½ cwts. Power required 2-h.p. Shipping dimensions, 6′ 2″ × 4′ 2″ × 2′ 11″.

PRICE complete, with one set of spanners and instruction card, ½″ mortise chain, guide bar and sprocket wheel for mortises ½″ × 2″ × 5½″ deep, ½″ hollow chisel and auger, as per specification, on application.

EXTRAS.—Chain Cutter Grinding Machine, on application.

Machine arranged for mortising hubs, fitted with dividing heads and canting arrangement for taper mortises, on application.

Extended base for electric drive, on application.

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BAND SAWING MACHINES.

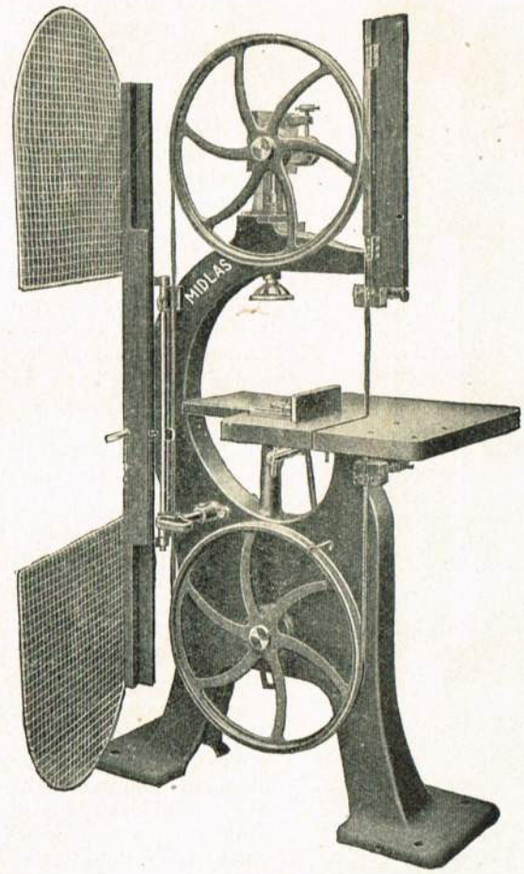

Fig. 6238. The "Midlas" Band Sawing Machine is of new well-balanced and rigid construction. Made of fine close grain cast iron in one hollow box section. Fitted with ball bearings in dust proof grease packed housings. Provided with a machined canting table 22″ x 20″, with special patent tilting arrangement. Graduated scale for various angles from 90° to 45°. Fitted with balanced wheels with vulcanite rubber treads. Spindle bearings of mild steel. The top wheel being adjustable. Fitted with instantaneous tracking device which can be operated whilst saw is in motion. Spring tension and saw guide above and below table. The machine is fully guarded and can be opened by one movement. The fence can be fitted either side of saw. Fast and Loose Pulley are provided with Striking Gear.

Size of Fast and Loose Pulleys ...	7″ x 3″
Speed ...	650 r.p.m.
Maximum depth of cut ...	10″
Motor required ...	approx. 1½ H.P.
Approximate nett weight ...	5 cwts.
Approximate weight packed for shipment ...	6½ cwts.
Price ...	**£27 0 0.**

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BAND SAWING MACHINES.

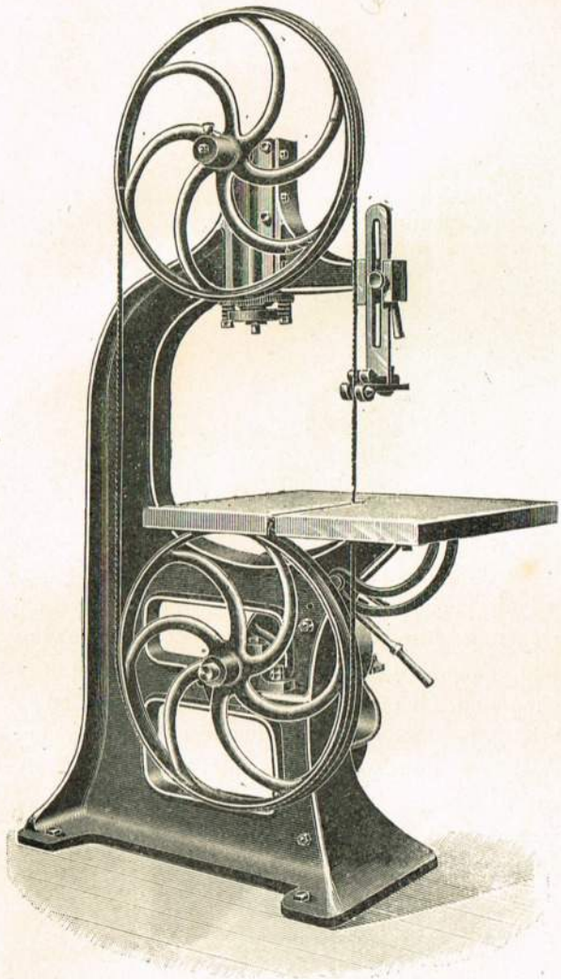

Fig. 6239.

The frames of these Benches being in one casting, are strong, well ribbed, and of good design, having a large base area which ensures steady running for the saw wheels.

The saw wheels are accurately turned, balanced, and covered with rubber bands, the upper wheel being adjustable for various length saws by a spring carried screw, which greatly protects the saw from breakage caused by undue strain when cutting.

The table is truly planed and is fitted with a canting motion.

The driving spindle is long, and carried in two adjustable gun-metal bearings of ample proportions, and is fitted with fast and loose pulleys and belt shifting gear.

In all sizes the top saw wheel is made to cant, enabling the sawyer to run the saw on any part of the wheel.

The saws run between adjustable hardwood side guides and two hardened steel roller back guides, these rollers being fixed one above the table and one below, take the thrust of the cutting with a minimum of friction, thus giving long life to the saws.

Can be fitted with canting or adjustable fence if required at £2 10s. extra. Saw supplied with each bench.

PRICES OF EXTRA SAWS.

½″	⅝″	¾″	⅞″	1″	1¼″	1½″ wide
2/–	**2/3**	**2/6**	**3/–**	**3/3**	**3/10**	**4/6** per yard

4 yards lowest charge. Odd 6″ charged as 1 foot.

SIZES AND PRICES.

No.	Size of table	Diam. of saw pulleys	Max. depth of cut	Diam. of driving pulleys	Revs. per minute	B.H.P.	Price
1	20″×20″	20″	10″	8″×3″	450	½	**£25 0 0**
2	24″×24″	24″	12″	10″×3″	450	1	**£27 10 0**
3	30″×30″	30″	14″	12″×3½″	400	1½	**£40 0 0**
*3A	30″×30″	30″	14″	12″×3½″	400	1½	**£50 0 0**
4	36″×36″	36″	16″	14″×4″	350	2	**£56 0 0**

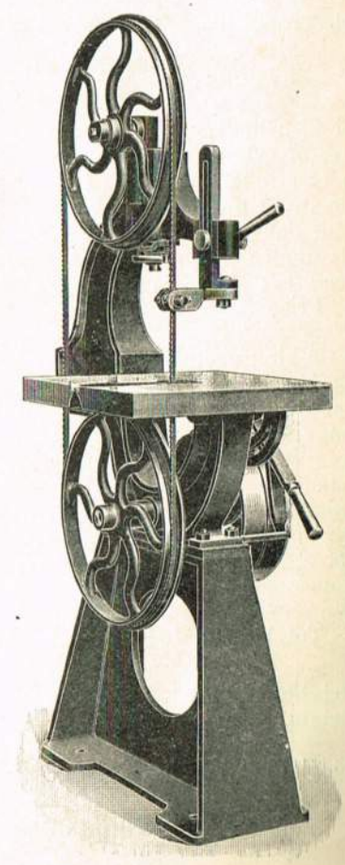

Fig. 6240.

SMALL BAND SAWING MACHINE.

These Benches are specially made for small users.

The saw wheels are accurately turned, balanced, and covered with rubber bands, the upper wheel is adjustable for various length saws.

The table is truly planed and is fitted with a canting motion.

SIZES AND PRICES (including Saw).

	Size of table	Diameter of saw pulley	Maximum depth of cut	Diameter of driving pulleys	Revolutions per minute	Price
No. 0	16″×16″	16″	5″	8″×3″	450	**£18 0 0**

If fitted with loose pulley and belt shifter, **24**/– extra.

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AIR COMPRESSORS.

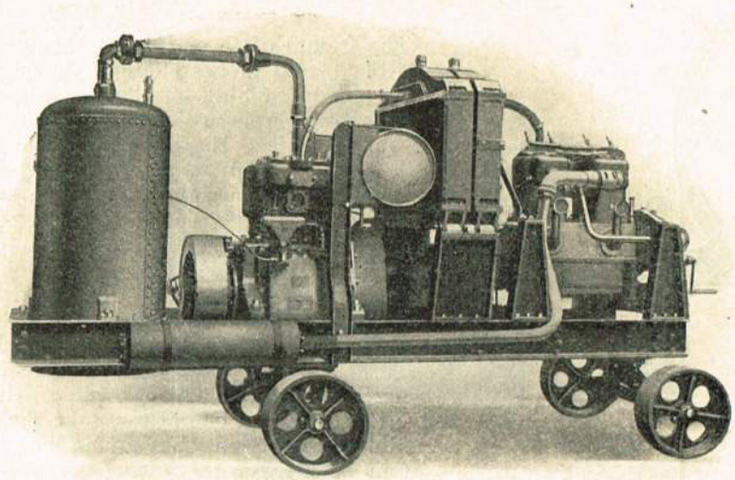

Fig. 7000.

SPECIFICATION.—Twin cylinder water-jacketed totally enclosed air compressors, with mechanically operated suction valves. Portable compressor plant. Crank chamber in one casting, fitted with inspection doors, allowing internal portion of engine to be easily inspected and enabling piston and connecting rods to be removed without first detaching cylinder. Lubrication is forced by means of gear or plunger pump, oil passes through a filter at the base, and can be removed whilst engine is running. The crankshaft, which is of best Siemens' Martin steel, is hollow and drilled to allow oil to pass to main and big end bearings, up through a tube to gudgeon pin bearings to cylinder wall. The suction valves are of mushroom type, mechanically operated by cams, actuated from big end of connecting rods. The **delivery** valves are of the plate type; seatings are made from bronze or steel. The fly-wheel is well balanced and of ample proportion. These compressors are very compact and exceedingly efficient machines.

Model No. 21.

SPECIFICATION.

Number of cylinders			2
Diameter of cylinders, inches			6
Length of stroke, inches			7
Free air swept by piston, cubic feet ...			96
Actual air delivered, cubic feet			80
Pressure of air delivered, lbs. per square inch			100
H.P. required, 26 at compressor fly-wheel.			
Price	**£82**	**10**	**0**
	£	s.	d.
Automatic air governor	**11**	**11**	**0**
Portable base plate	**53**	**13**	**0**
Air Receiver, 2 ft. × 5 ft., with safety valve, gauge and drain cock	**14**	**13**	**6**
Improved gearing with coupling and bolts..	**45**	**18**	**6**
Water tank	**3**	**13**	**6**
Circulating Pump	**6**	**6**	**0**
4-cylinder internal combustion engine ...	**141**	**15**	**0**
Radiator	**26**	**5**	**0**
Piping and coupling up	**13**	**2**	**6**
Total cost, Model 21	**£398**	**18**	**0**

Weight, nett—1 ton 14 cwts.
Weight, gross—2 tons.

Shipping size, in box, 132″ × 39″ × 69″.

Model No. 22.

SPECIFICATION.

Number of cylinders			2
Diameter of cylinders, inches			7
Length of stroke, inches			8
Free air swept by piston, cubic feet ...			148
Actual air delivered, cubic feet			80
Pressure of air delivered, lbs. per square inch			100
H.P. required, 26 at compressor fly-wheel.			
1 automatic air governor			
Price	**£109**	**11**	**0**
	£	s.	d.
Portable base plate	**71**	**7**	**0**
Air Receiver, 2 ft. × 5 ft., with safety valve, gauge and drain cock	**14**	**3**	**6**
Improved gearing with coupling and bolts..	**66**	**10**	**6**
Water circulating pump	**6**	**6**	**0**
4-cylinder internal combustion engine ...	**189**	**0**	**0**
2 radiators	**36**	**15**	**0**
Piping and coupling up	**13**	**2**	**6**
Total cost, Model 22	**£506**	**15**	**6**

Weight, nett—3 tons 10 cwts.
Weight, gross—4 tons.

Shipping size, in box, 150″ × 40″ × 78″.

Delivery—Special quotations given. Plus 5% extra F.O.R. British Port.
Other types and sizes of air compressors quoted for.

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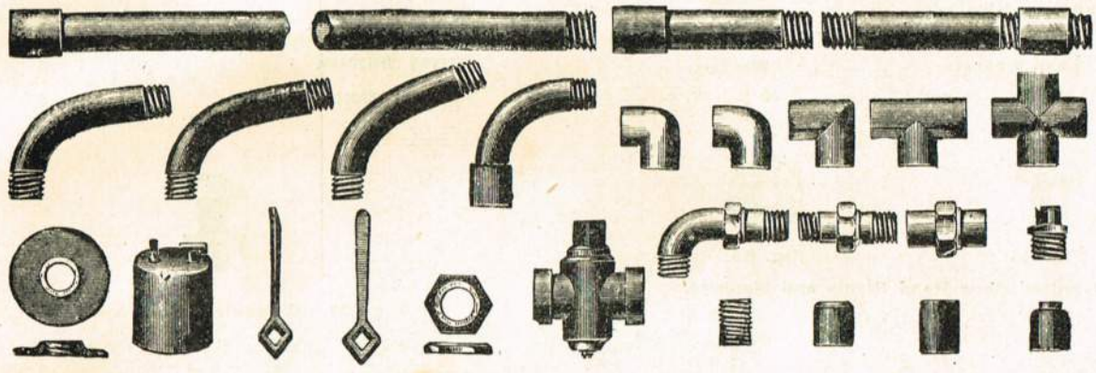
WROUGHT IRON TUBES AND FITTINGS

FOR GAS, WATER, AND STEAM.

Revised January 1, 1921.



Tubes.

Internal diam. (nominal) in inches	⅛ & ¼	⅜	½	¾	1	1¼	1½	1¾	2	2¼	2½	3	3½	4	4½	5	6
Tubes, 2 ft. long and over, per ft.	-/4	-/4¼	-/5½	-/6¾	-/9½	1/1	1/4½	1/8	1/10	2/6	2/10	3/3	4/-	4/5	5/6	6/-	7/6
Pieces, 12 to 23½ in. long each	-/10	-/11	1/1	1/5	1/11	2/8	3/4	4/6	4/9	6/9	8/-	10/6	13/6	15/6	21/-	24/-	32/6
Pieces, 4 to 11½ in. long, each	/-7	-/8	-/9	-/11	1/3	1/8	2/2	2/10	3/-	4/3	5/3	6/9	9/3	10/9	15/6	18/-	25/3
Longscrews, 12 to 23½ in. lonfg ... ...each	-/11	1/-	1/3	1/7	2/2	2/10	3/9	5/-	5/3	7/6	9/-	12/-	15/6	17/-	23/-	26/6	35/6
Longscrews, 3 to 11½ in. long ... ...each	-/8	-/9	-/10	1/1	1/5	1/11	2/6	3/3	3/6	5/-	6/6	8/6	11/6	13/-	17/-	20/-	28/-
Barrel nupples ...each	-/5	-/5	-/6	-/7	-/9	1/-	1/4	1/8	1/9	2/6	3/-	4/-	6/-	7/-	10/-	12/6	20/-
Bends ... . ,,	-/8	-/9	-/11	1/2	1/7½	2/7½	3/2	4/2	5/2	8/6	12/-	18/-	25/-	32/6	80/-	105/-	150/-
Springs, not socketed ,,	-/5	-/6	-/7	-/9	1/1½	1/11½	2/3½	3/1	3/11	6/9	9/6	14/6	20/-	26/6	70/-	93/-	132/-

Fittings.

Internal diam. (nominal) in inches	⅛ & ¼	⅜	½	¾	1	1¼	1½	1¾	2	2¼	2½	3	3½	4	4½	5	6
Socket union, pipe union, each	2/-	2/6	3/-	4/-	5/6	6/9	8/-	9/-	10/-	15/-	17/6	22/6	27/6	35/-	48/-	66/-	105/
Elbows, square ... ... ,,	-/10	-/11	1/1	1/3	1/6	2:2	2/7	3/4	4/3	6/9	9/6	14/-	22/-	28/-	75/-	95/-	150/-
Elbows, round ... ... ,,	-/11	1/-	1/2	1/5	1/8	2/4	2/10	3/9	4/8	7/3	10/6	16/-	24/-	30/-	75/-	95/-	150/-
Tees ... ... ,,	1/-	1/1	1/3	1/7	1/10	2/6	3/1	4/2	5/1	7/9	11/6	18/-	26/-	32/-	78/-	98/-	155/-
Crosses... ... ... ,,	2/2	2/4	2/9	3/3	4/1	5/6	6/7	8/6	10/6	17/-	22/-	40/-	56/-	66/8	175/-	220/-	350/-
Sockets, plain ... ... ,,	-/3	-/3	-/4	-/5	-/6	-/8	-/10½	1/1	1/3	1/9	2/6	3/6	5/-	6/-	10/-	12/-	18/-
Sockets, diminished ... ,,	-/4	-/5	-/6	-/7	-/9	1/-	1/4	1/9	2/-	4/-	5/-	7/-	8/-	11/-	25/-	35/-	55/-
Flanges ... ... ,,	-/9	-/10	1/-	1/2	1/4	1/9	2/-	2/3	2/9	4/-	5/-	8/6	10/-	11/6	16/-	18/-	27/-
Caps ... ... ,,	-/3½	-/3½	-/5	-/6	-/8	1/-	1/3	1/7	2/-	3/-	4/4	6/-	9/9	10/6	25/-	30/-	45/-
Plugs ... ... ,,	-/3	-/3	-/4	-/5	-/6	-/8	-/10	1/-	1/3	2/-	2/6	4/9	7/-	10/-	22/-	30/-	48/-
Backnuts ... ... ,,	-/2	-/2	-/3	-/3½	-/5	-/6	-/8	-/10	1/1	1/9	2/3	3/6	4/6	5/6	14/-	18/-	26/-
Nipples .... ,,	-/2	-/2	-/3	-/3½	-/4	-/6	-/8	-/10	1/-	1/9	2/3	3/6	4/6	5/6	14/-	18/-	26/-
Union bends ... ... ,,	2/6	3/-	3/9	5/-	6/3	8/6	10/-	11/6	13/6	21/-	27/-	37/-	49/-	58/-	78/-	100/-	160/-
Main Cocks ... ... ,,	1/6	1/9	2/3	2/10	4/2	5/4	7/-	11/6	11/6	16/-	17/6	26/-	40/-	47/9	125/-	125/-	165/-
Main cocks, with brass plugs ... ... ,,	—	3/4	4/-	5/4	7/6	10/-	13/-	21/-	21/-	34/-	40/-	50/-	75/-	100/-	225/-	225/-	325/-
Roundway cocks ... ,,	—	2/7½	3/-	4/1½	5/7½	7/6	9/9	13/1½	16/6	28/6	45/-	56/3	90/-	120/-	—	—	—
Roundway cocks, with brass plugs ... ,,	—	7/10½	9/-	12/4½	16/10½	22/6	29/3	39/4½	49/6	85/6	135/-	168/9	270/-	360/-	—	—	—
Cock spanners, wrought ,,	—	1/1½	1/3	1/7½	2/-	2/4½	2/7½	3/-	3/3	3/7	4/6	6/9	9/-	10/6	12/-	14/3	18/-
Cock spanners, malleable cast ... ... ,,	—	-/9	1/-	1/3	1/6	1/9	2/3	2/7½	3/-	3/7	4/6	6/9	9/-	10/6	12/-	14/3	19/-
Syphon boxes—																	
1 quart ... ... ,,	—	—	22/9	23/-	23/4	24/-	24/6	25/2	26/3	28/6	—	—	—	—	—	—	—
2 quarts ... ... ,,	—	—	—	27/-	27/4	28/-	28/6	29/2	30/3	32/6	35/6	42/6	—	—	—	—	—
3 quarts ... ... ,,	—	—	—	32/-	32/4	33/-	33/6	34/2	35/3	37/6	40/6	47/6	55/6	61/6	—	—	—
1 quarts ... ... ,,	—	—	—	38/-	38/4	39/-	39/6	40/2	41/3	43/6	46/6	53/6	61/6	67/6	—	—	—

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WASHERS, SHEET IRON, WIRE.

Fig. G1. Galvanized Washers
42/– cwt. **1**/– per gross.
Fig. G1A. Lead Washers.
60/– cwt. **1/3** per gross.

Fig. G2. Galvanized Limpet Washers.
3/10 per gross.

Fig. G3. Galvanized Embossed Curved Washers.
1/7 per gross.

Fig. G4. Galvanized Diamond Washers.
For $\frac{5}{16}$ and $\frac{3}{8}$ bolts, **3/4** per gross.
For $\frac{1}{4}$ bolts, **2/6** per gross.

Fig. G5.

Fig. G6.

Galvanized Cone Head Rivets and Washers.

$\frac{3}{8}'' \times \frac{1}{4}''$	$\frac{1}{2}'' \times \frac{1}{4}''$	$\frac{3}{4}'' \times \frac{1}{4}''$
50/– cwt.	**50**/– cwt.	**50**/– cwt.
1/– gross.	**1/3** gross.	**1/6** gross.

Fig. G6. Washers, **50**/- cwt., **1/2** gross.

Fig. G7. Galvanized Bolts and Nuts.

	$\frac{3}{4}'' \times \frac{1}{4}''$	$1'' \times \frac{1}{4}''$	$1\frac{1}{4}'' \times \frac{1}{4}''$	$1\frac{1}{2}'' \times \frac{1}{4}''$	$2'' \times \frac{1}{4}''$
Price per gross ...	**2/7**	**2/9**	**3**/–	**3/4**	**4**/–

Fig. G8. HOOP IRON, Black.

In coils of about $\frac{1}{2}$ cwt.

Inches	$\frac{1}{2} \times 26$	$\frac{5}{8} \times 26$	$\frac{3}{4} \times 26$	$\frac{3}{4} \times 24$ gauge
Black	**29/9**	**29**/–	**28/9**	**28**/– per cwt.

In Bundles of about $\frac{1}{2}$ cwt.

Inches	2×15	$1\frac{3}{4} \times 16$	$1\frac{1}{2} \times 16$	$1\frac{1}{4} \times 17$	1×18 gauge

Basis price, all **19/3** cwt.

Inches	$\frac{7}{8} \times 19$	$\frac{3}{4} \times 20$	$\frac{3}{4} \times 22$	$\frac{3}{4} \times 24$ gauge
	1/3	**3/9**	**7/6**	**12/6**

Per cwt. extra over basis price.

Fig. G9. Galvanized Hoops, in bundles of about $\frac{1}{2}$ cwt.

Inches	$1\frac{1}{2} \times 16$	$1\frac{1}{4} \times 17$	1×18	$\frac{3}{4} \times 20$
	34/6	**34/6**	**34/6** cwt.	**5**/– per cwt. extra

Fig. G10. TIN PLATES.

Charcoal Primes—

	1c	1x	2x	3x	4x	
28×20 56 Sheets ...	**50**/–	**57/6**	**59/6**	**72/6**	**80**/–	per box
	Dc	Dx	Dxx	D3x	D4x	
25×17 50 Sheets ...	**48**/–	—	**63**/–	—	—	per box.

Coke Wasters—

	1c	1x	
28×20 112 Sheets ...	**69**/–	—	per box.
20×14 112 ,, ...	**34**/–	**40**/–	,,

Fig. G11. COPPER WIRE.

In 7 lb. hanks	12	13	14	15	16	17	18	19 G.
		1/3 per lb.				$\frac{1}{2}$d.	$\frac{1}{2}$d.	**1**d.
						per lb. extra.		

Not less than 7 lbs. of a size sold.

Fig. G12. GALVANIZED PLAIN WIRE, in 1 cwt. coils.

Basis Price for 8 G.	Under 2 cwts.	2 cwts.	4 cwts.	10 cwts.	
Delivered Country Station	**31/3**	**29**/–	**27**/–	**26/3**	per cwt.
Delivered London (12 miles radius)	**26/3**	**26/3**	**25**/–	**25**/–	,,

One Cwt. contains about ...	550	675	850	1040	1300	1650	2200	2700	3400	4500	6100	8750	10800 yards.
	8	9	10	11	12	13	14	15	16	17	18	19	20 G.
Extras	—	**10d.**	**1/8**	**2/6**	**3/6**	**5**/–	**6/6**	**8**/–	**10**/–	**12**/–	**14**/–	**16/6**	**20**/– per cwt. extra.

28 lbs. **1/3** 14 lbs. **2/6** 7 lbs. rings **3/3** per cwt. extra.
1 lb. **10**/– $\frac{1}{2}$ lb. **10**/– $\frac{1}{4}$ lb. hanks **12/6** per cwt. extra.

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BARBED WIRE, WASHERS, Etc.

Fig. G20. Galvanized Barb Wire, 4 point, ordinary or thick-set.

One cwt. of 4 point ordinary contains about 560 yards.
One cwt. of 4 point thick-set contains about 460 yards.

	Under 2 cwts.	2 cwts.	4 cwts.	10 cwts.
Delivered Country Station	**32/–**	**29/–**	**27/6**	**27/–** per cwt.
Delivered London, 12 miles radius	**27/–**	**27/–**	**26/6**	**26/6** „

¼ cwt. Reels, **5/–** per cwt. extra.

Fig. G21. Patent Galvanized Spring Head Roofing Nails, with twisted shank. No washer required. Will drive through sheets and driest hardwood. 2½ inches long.

Prices per gross :—In gross boxes—12 gross, **3/9** ; 25 gross, **3/9** ; 50 gross, **3/8** ; 100 gross, **3/4**

Lots of 25 gross and up delivered free.

Fig. G22. Galvanized Gutter Screws.

4″	4½″	5″	6″×¼″ diam.
11/–	**12/6**	**13/10**	**16/–** gross.

Fig. G23. Galvanized Gutter Screws.

	1″×16	1¼″×16
12 gross lots ...	**4/2**	**4/8**
25 „ ...	**4/1**	**4/7**
50 „ ...	**3/11**	**4/5**

Fig. G24. Gutter Bolts and Nuts.

¾×¼″	1″×¼″	1¼″×¼″	1½″×¼″
2/3	**2/6**	**2/7**	**2/8**

per gross.

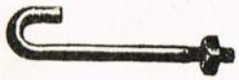

Fig. G25.
Galvanized Hook Bolts and Nuts.

3″×¼″	3½″×¼″	4″×¼″	4½″×¼″	3″× 5/16″
6/3	**6/4**	**7/2**	**7/10**	**8/1**
3½″× 5/16″	4″× 5/16″	4½″× 5/16″	5″× 5/16″	5½″× 5/16
8/9	**9/4**	**10/–**	**10/7**	**11/3**
6″× 5/16″	4½″×⅜″	5″×⅜″		
11/11	**12/–**	**12/10**	per gross.	

Fig. G26.
Galvanized Cone Head Nails.

Size, ins. ...	2	2¼	2½	3
Gross	**2/2**	**2/3**	**2/6**	**2/8**

All Sizes in 1 cwt. lots, **39/–**

Fig. G27.
Galvanized Roofing Screws.

Size, ins. ...	2	2¼	2½	3
Price, cwt.....	**71/6**	**69/–**	**64/–**	**61/–**
Price, gross ..	**2/6**	**2/9**	**3/5**	**4/1**

Fig. G28.
Galvanized Straining Eye Bolts.

With one square nut and one round washer.

Length, ins.	6×¼	9×⅜	12×⅜	15×½
Price, doz.	**1/7**	**2/9**	**3/1**	**6/–**

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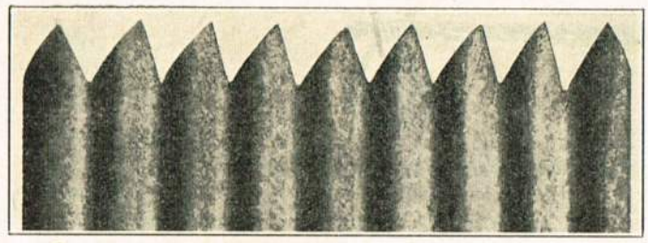
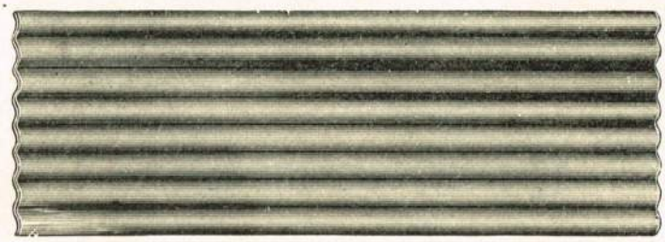
CORRUGATED SHEETS.





We hold large stocks of galvanized corrugated sheets in standard lengths and gauges, and are thus able to effect immediate delivery.

Special prices quoted for 2-ton lots, delivered at purchaser's nearest goods station.

Corrugated sheets, curved, or with serrated tops, black or galvanized.

APPROXIMATE NUMBER OF GALVANIZED CORRUGATED SHEETS PER TON.

B.G.	Size Flutes.	...	ft. 5	ft. in. 5 6	ft. 6	ft. in. 6 6	ft. 7	ft. in. 7 6	ft. 8	ft in. 8 6	ft. 9	ft. in. 9 6	ft. 10	ft. 11	ft. 12
16	5/5 ins.	...	70	64	58	54	50	47	44	41	39	37	35	32	29
,,	6/5 ,,	...	59	54	49	45	42	39	37	35	33	31	29	27	24
18	5/5 ,,	...	86	78	72	66	62	57	54	51	48	45	43	39	36
,,	6/5 ,,	...	74	67	62	56	53	50	46	43	41	39	37	34	31
20	8/3 ,,	...	114	104	95	88	81	76	71	67	63	60	57	52	47
,,	10/3 ,,	...	95	86	79	73	68	64	59	56	53	50	47	43	39
22	8/3 ,,	...	139	127	116	107	99	93	87	82	77	73	69	63	58
,,	10/3 ,,	...	116	105	97	90	83	78	73	68	65	61	58	52	48
24	7/3 ,,	...	189	172	157	146	135	126	118	110	104	99	94	85	78
,,	8/3 ,,	...	168	153	140	130	120	112	105	98	93	88	84	76	70
,,	9/3 ,,	...	154	140	128	119	110	103	96	90	85	81	77	70	64
,,	10/3 ,,	...	140	128	117	108	100	94	88	83	78	74	70	64	58
26	7/3 ,,	...	251	228	209	193	178	167	156	147	139	131	125		
,,	8/3 ,,	...	223	203	186	172	159	149	139	131	124	117	111		
,,	9/3 ,,	...	204	186	170	157	146	136	127	120	113	107	101		
,,	10/3 ,,	...	186	169	155	143	133	124	116	109	103	98	93		
28	7/3 ,,	...	270	246	225	208	193	181	168	158	149	142	135		
,,	8/3 ,,	...	240	219	200	185	172	161	150	141	133	126	120		
,,	9/3 ,,	...	220	200	188	169	158	147	137	129	122	116	110		
,,	10/3 ,,	...	200	182	167	154	143	133	125	118	111	105	100		
29	7/3 ,,	...	296	271	247	228	212	198	184	174	164	155	148		
,,	8/3 ,,	...	264	241	220	203	189	176	165	155	146	138	132		
30	7/3 ,,	...	324	297	270	249	231	216	202	191	180	169	162		
,,	8/3 ,,	...	288	264	240	222	206	192	180	170	160	151	144		

Flat Sheets, 30″ wide, count as 8/3 Flutes, and 36″ wide, as 10/3 Flutes.

See next page for prices.

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CORRUGATED SHEETS.

APPROXIMATE WEIGHTS

GALVANIZED CORRUGATED SHEETS.

Gauge	16 B.W.G.		18 B.W.G.		20 B.W.G.		22 B.W.G.		24 B.W.G.		26 B.W.G.		28 B.W.G.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Corrugations	5 5	6 5	8 3	10 3	8 3	10 3	8 3	10 3	8 3	10 3	8 3	10 3	9 3	10 3
Width over all	27½in.	32½in.	26½in.	32½in.	26½in.	32½in.	26½in.	32½in.	26½in.	32½in.	26½in.	32½in.	26½in.	32in.
Width when laid ...	25in.	30in.	24in.	30in.	24in.	30in.	24in.	30in.	24in.	30in.	24in.	30in.	24in.	30in.
Length.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
ft. in.														
3 0	21	24½	15	18⅝	12½	15⅝	10¼	12⅝	8⅛	10	6¼	7⅜	5½	6¾
3 6	24½	28½	17½	21½	14½	18⅛	11¾	14½	9½	11¾	7⅜	9¼	6½	8
4 0	28	32½	20	25	16¾	20¾	13⅜	16¾	11	13⅜	8⅜	10½	7½	9
4 6	31½	36½	22½	28	18¾	23⅜	15	18⅝	12¼	15	9⅜	11¾	8¼	10¼
5 0	35	40¾	25	31	21	25¾	17	21	13½	16¾	10½	13	9¼	11¼
5 6	38½	45	27½	34⅛	23	28½	18¾	23⅝	14⅞	18⅝	11½	14⅜	10¼	12½
6 0	42	49	30	37¼	25	31¼	20½	25¼	16¼	20	12½	15¾	11	13½
6 6	45½	53	32½	40⅛	27	33¾	22	27⅛	17⅝	21¾	13⅝	17	12	14¾
7 0	49	57	35	43	29	36¼	23½	29	19	23½	14¾	18¼	13	15¾
7 6	52½	61	37½	46½	31¼	38⅞	25⅜	31¼	20½	25⅛	15¾	19½	13¾	17
8 0	56	65	40	50	33½	41½	26¾	33½	22	26¾	16¾	21	14¾	18
8 6	59½	69¼	42½	53	35½	44⅛	28⅜	35⅜	23¼	28⅜	17¾	22¼	15¾	—
9 0	63	73½	45	56	37½	46¾	30	37¼	24½	30	18¾	23½	16½	—
9 6	66½	77½	47½	59	39¾	49¼	31⅞	39⅜	25⅛	31¾	19¾	24¾	—	—
10 0	70	81½	50	62	42	52	33¾	41½	26¾	—	—	—	—	—
10 6	73½	85¾	52½	—	44	—	35⅝	—	28¼	—	—	—	—	—
11 0	77	90	55	—	46	—	37½	—	29¾	—	—	—	—	—
11 6	80½	94	57½	—	48	—	39¼	—	31⅛	—	—	—	—	—
12 0	84	98	60	—	50	—	41	—	32	—	—	—	—	—

These Weights are approximate only, and are not guaranteed.

PRICES.

In the table below is given the price per sheet of the various lengths and gauges, the equivalent price per ton being given at the top of each column. In all cases the prices are on the basis of a sheet 2·2 wide, *i.e.*, with eight 3in. corrugations.

At per	20 G.					22 G.					24 G.				
Ton...	15/10/0	17/10/0	19/10/0	21/10/0	23/10/0	16/0/0	18/0/0	20/0/0	22/0/0	24/0/0	16/0/0	18/0/0	20/0/0	22/0/0	24/0/–
4 ft.	**2/2**	**2/6**	**2/9**	**3/1**	**3/4**	**1/10**	**2/1**	**2/4**	**2/6**	**2/9**	**1/6**	**1/9**	**1/11**	**2/1**	**2/4**
5 ft.	**2/9**	**3/1**	**3/5**	**3/9**	**4/2**	**2/4**	**2/7**	**2/11**	**3/2**	**3/6**	**1/11**	**2/2**	**2/4**	**2/7**	**2/10**
6 ft.	**3/3**	**3/8**	**4/1**	**4/6**	**4/11**	**2/9**	**3/1**	**3/5**	**3/9**	**4/2**	**2/4**	**2/7**	**2/10**	**3/2**	**3/5**
7 ft.	**3/10**	**4/4**	**4/10**	**5/4**	**5/10**	**3/3**	**3/8**	**4/1**	**4/5**	**4/10**	**2/8**	**3/0**	**3/4**	**3/8**	**4/–**
8 ft.	**4/4**	**4/11**	**5/6**	**6/1**	**6/8**	**3/8**	**4/2**	**4/7**	**5/–**	**5/6**	**3/–**	**3/5**	**3/10**	**4/2**	**4/7**
9 ft.	**4/11**	**5/7**	**6/2**	**6/10**	**7/5**	**4/2**	**4/8**	**5/2**	**5/9**	**6/3**	**3/5**	**3/10**	**4/4**	**4/9**	**5/2**
10 ft.	**5/7**	**6/4**	**7/–**	**7/8**	**8/4**	**4/9**	**5/4**	**5/11**	**6/6**	**7/1**	**3/11**	**4/5**	**4/11**	**5/4**	**5/10**

At per	26 G.				
Ton...	19/0/0	21/0/0	23/0/0	25/0/0	27/0/0
4 ft.	**1/5**	**1/6**	**1/8**	**1/10**	**1/11**
5 ft.	**1/8**	**1/10**	**2/1**	**2/3**	**2/5**
6 ft.	**2/1**	**2/3**	**2/6**	**2/9**	**2/11**
7 ft.	**2/5**	**2/8**	**2/11**	**3/2**	**3/5**
8 ft.	**2/9**	**3/–**	**3/4**	**3/7**	**3/10**
9 ft.	**3/4**	**3/8**	**4/–**	**4/4**	**4/8**
10 ft.	**3/9**	**4/1**	**4/6**	**4/10**	**5/2**

GALVANIZED RIDGING.

15 inch × 24 G **3/–**
18 inch × 24 G **3/6**
Per 6 ft. length.

12 inch × 26 G **2/6**
12 inch × 26 G **2/9**
Per 6 ft. length.

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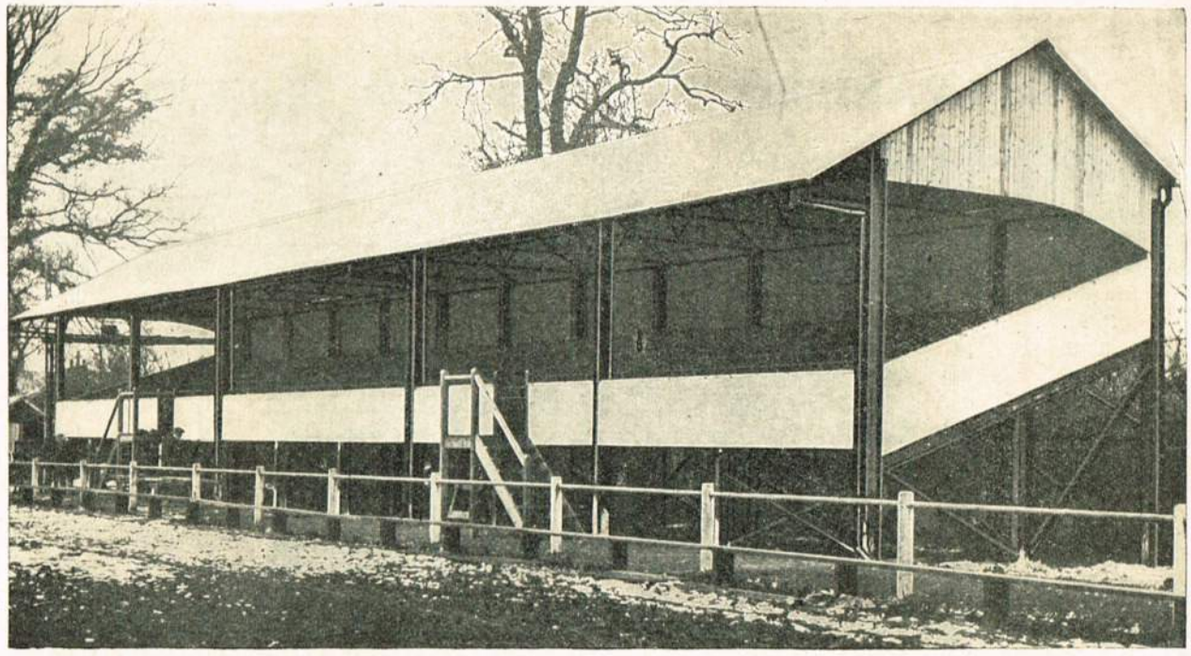
FOOTBALL STAND.



This Stand is 100 feet long, 20 feet wide, and comfortably accommodates 500 people.

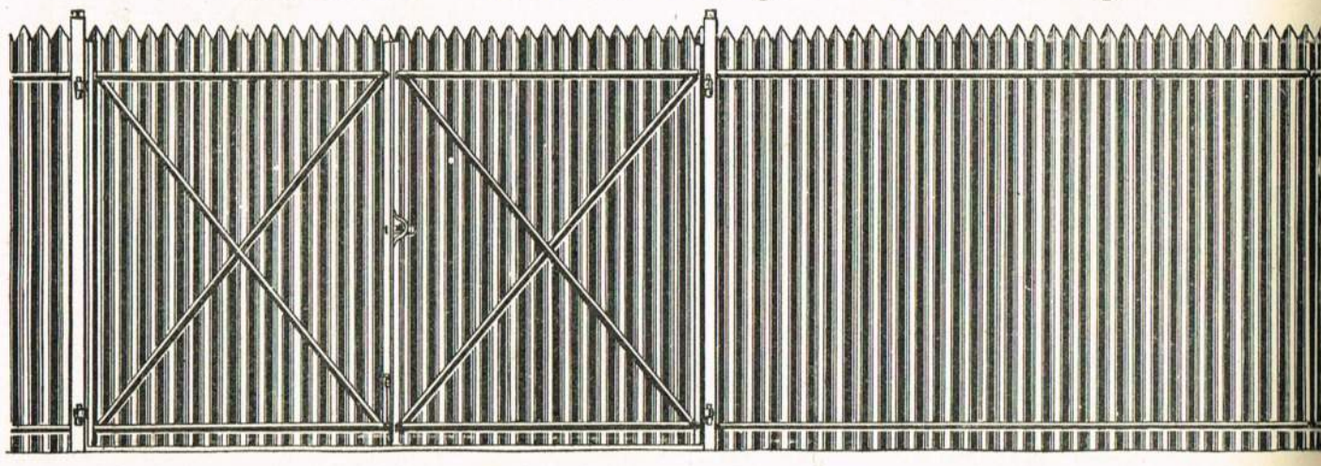
The structure is entirely of steel with the exception of the galleries and seats, which are framed up in good, sound, dry and well-seasoned timber. The roof is covered with 22-gauge galvanized corrugated sheeting, properly dressed to seams and rivetted at laps. Gutters at front and back are of pressed steel with rainwater pipes to ground line.

There is plenty of room under the stand for Dressing and Refreshment Rooms, although these are not included in this instance.

Approximate Price delivered and erected complete, **£850.**

We shall be pleased to design and estimate for any size or style of Steel-framed Stand for Race Course or Sports Ground. Prospective Purchasers waited upon by our Technical Experts in any part of the Country by arrangement.

Unclimbable Galvanized Corrugated Sheet Fencing.



	Prices.					
Height	5 ft.	6 ft.	7 ft.	8 ft.	9 ft.	10 ft.
Fencing with serrated tops, per yard	10/3	12/6	16/–	17/6	20/6	25/–
Hand Gates to match, 4 ft. wide, each	57/6	60/–	80/–	90/–	100/–	120/–
Pair of Gates to match, 10 ft. wide	125/–	135/–	170/–	180/–	200/–	250/–
Steel Gate Posts, per pair	75/–	80/–	100/–	120/–	140/–	175/–

WE ARE MANUFACTURERS OF—

ANGLE BAR CATTLE FENCING.
STRAINED WIRE FENCING.
RABBIT WARREN FENCING.
TENNIS COURT FENCING.
UNCLIMBABLE VERTICAL BAR RAILING.
PALISADING. GARDEN HURDLES.
TREE GUARDS.
FIELD AND ENTRANCE GATES.

PRICES AND DESIGNS ON APPLICATION.

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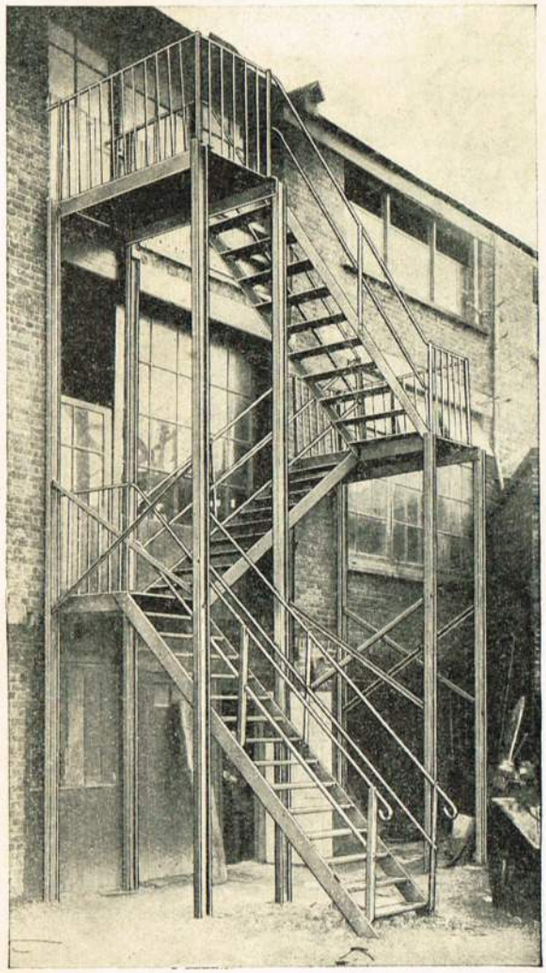
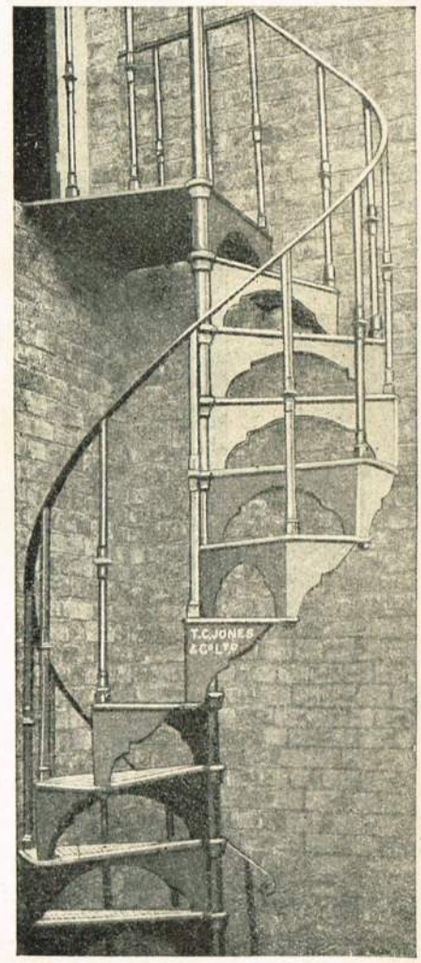
STAIRCASES.



FIRE ESCAPE
AND
SPIRAL STAIRCASES
Designed,
Erected
and
Manufactured
at
our Works,
Wood Lane, W. 12.



This is constructed entirely of steel. Total height to top landing, 23 ft. 6 ins.; width, 3 ft. The treads, risers and landings are of chequer plate. Handrails made of 1″ steel tubing, supported by angle uprights. Approximate cost **£85**, delivered free to any station within 50 miles from London.

This consists of steel centre post, sectional cast iron treads and risers, wrought iron rail, and cast iron banisters.

Approximate cost of a Spiral Staircase, 4 ft. dia. × 10 ft. long, with quarter circular landing, **£18,** delivered free to any station within 50 miles of London.

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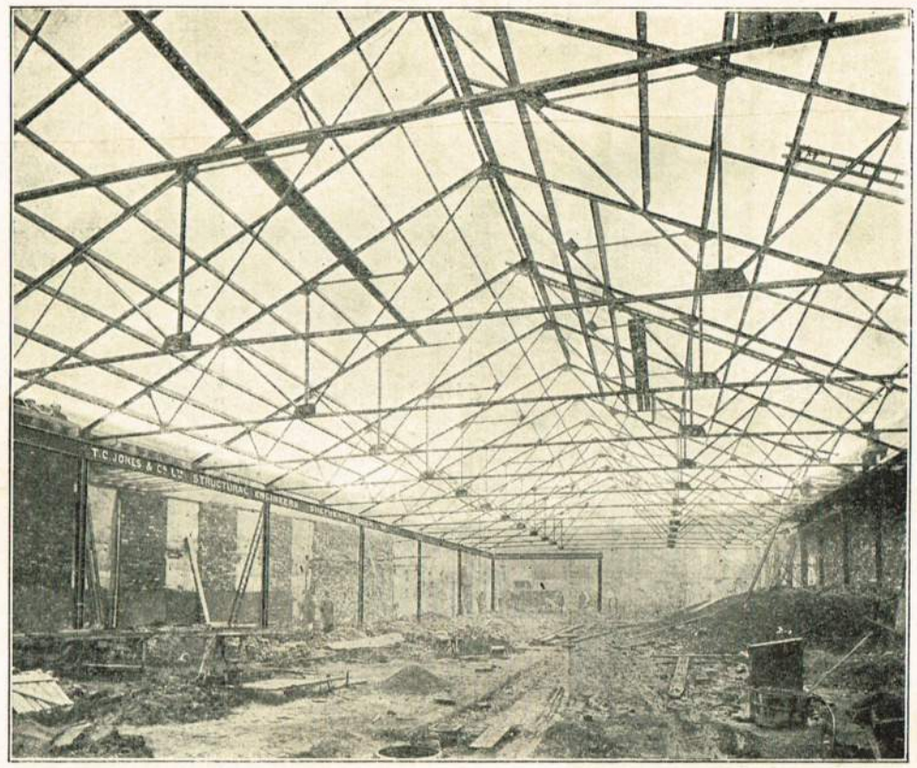
STEEL BUILDINGS.



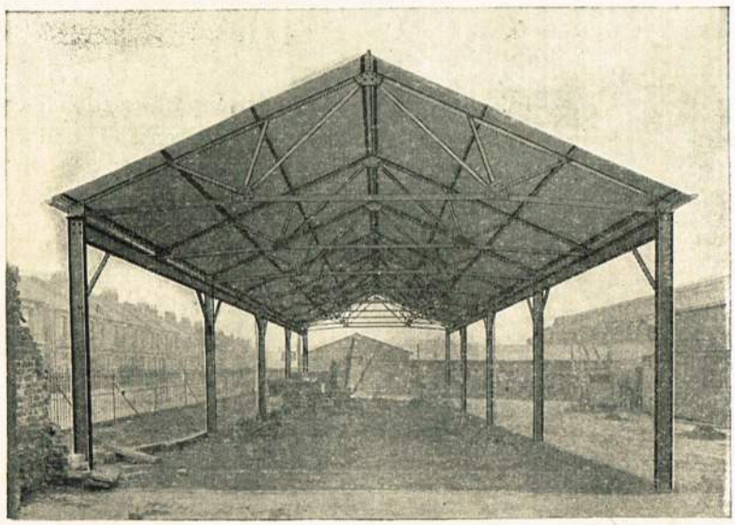
Steelwork for Garage 61 ft. wide by 130 ft. long erected by us, comprising thirteen steel roof trusses supported on brick wall one side and on the opposite side on R.S. girders and stanchions.

The covering (not included in price below) was of corrugated iron on timber purlins.

The cost of this delivered and erected in London was approximately **£300.**

Estimates submitted for roofs complete with glazing and covering of iron or asbestos sheets or slates on timber or steel purlins.

Purchasers should state width, length, nature of roof covering, whether roof is to be supported on brick piers and walls or on steel stanchions, and the height of the latter from ground level.



Cart Shed, 80 ft. long, 27 ft. wide, 12 ft. high to eaves, erected by us at Croydon.

The roofing is of 22-gauge galvanized corrugated sheeting rivetted at seams and laps and secured to steel purlins with hook bolts, nuts, and washers.

Pressed steel eaves, gutters, and down-pipes are provided to each side. Stanchions are set into Portland cement concrete.

Price for a similar Shed delivered and erected complete as shown, **£250.**

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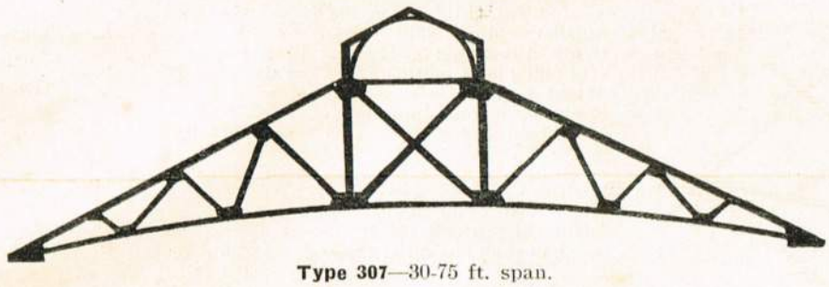
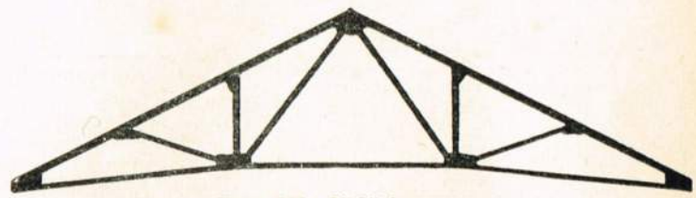
ROOF PRINCIPALS.

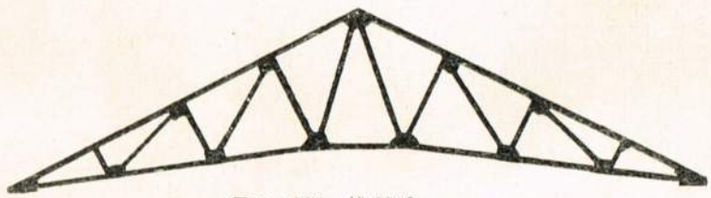


Type 307—30-75 ft. span.

Type 300—20-25 ft. span.



Type 302—25-35 ft. span.

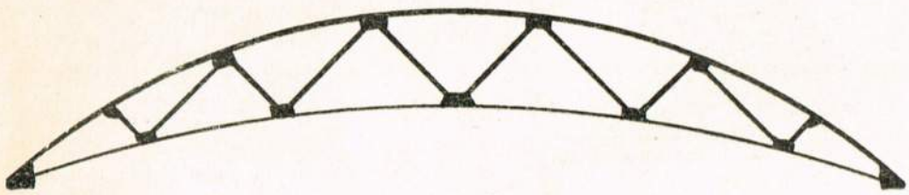


Type 305—40-60 ft. span.

STEEL PURLINS

A

SPECIALITY.



Type 337.

Suitable for spans up to 70 feet.

ROOFS

FOR ALL

PURPOSES.

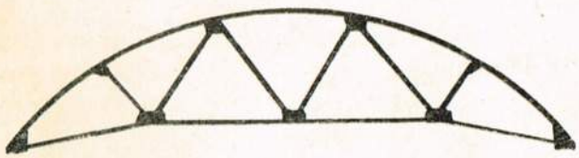
We design and manufacture all kinds of Roof Trusses.

Attention is particularly called to our standard types, Nos. 300, 302, 306, which, by mass production, we are able to produce at a minimum cost.

Prospective purchasers should state the nature of roof covering to the used—i.e. whether slates, tiles, corrugated iron or asbestos, also the distance apart of trusses and number required.

We shall be pleased to estimate to any special design of Truss or for Roofs complete.

Customers will be waited upon in any part of the Country by our expert representatives if desired.



Type 336.

Suitable for spans up to 50 feet.

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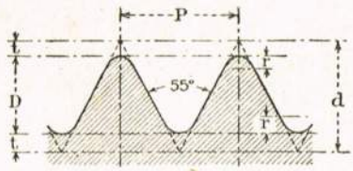
SCREW THREAD FORMULAS.



$P = \text{Pitch} = \dfrac{1}{\text{No. of threads per inch}}$

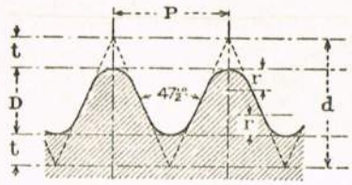
d = Angular depth = ·96 P

t = Depth of rounding off at top and of filling in at bottom = ·16 p or ·1666d = $\frac{1}{6}$d

D = Actual depth = ·64 P

r = Radius on top and in bottom of thread = ·1373 P

A.—Whitworth Standard Thread.
Angle 55°.
General engineering standard.



$P = \text{Pitch} = \dfrac{1}{\text{No. of threads per m/m}}$

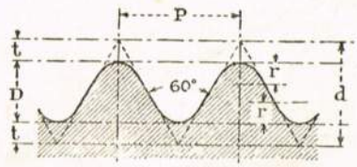
d = Angular depth = 1·136 P

t = Depth of rounding off at top and of filling in at bottom = ·236 d or ·268 P

D = Actual depth = ·6 P

r = Radius on top and in bottom of thread = ·1818 P or — $^2/_{11}$ P

B.—British Association (B.A.) Thread.
Angle 47½°.
Fine pitch.



$P = \text{Pitch} = \dfrac{1}{\text{No. of threads per inch}}$

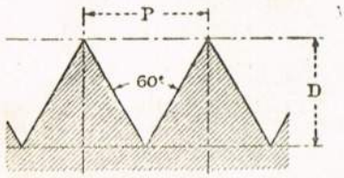
d = Angular depth = ·866 P

t = Depth of rounding off at top and filling in at bottom = ·1666 P = $\frac{1}{6}$ P or ·19246 d

D = Actual depth = ·5327 P

r = Radius on top and in bottom of thread = ·1666 P = $\frac{1}{6}$ P

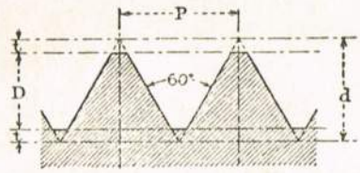
C.—Standard cycle Thread.
Angle 60°.



$P = \text{Pitch} = \dfrac{1}{\text{No. of threads per inch}}$

D = Angular and actual depth = ·866 P

D.—" V " Standard Thread.
Angle 60°.



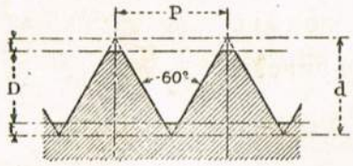
$P = \text{Pitch} = \dfrac{1}{\text{No. of threads per inch}}$

d = Angular depth = ·866 P

t = Truncation at top and filling in at bottom = ·125 d or ·10825 P

D = Actual depth = ·6459 P

E.—U.S. Standard Thread.
Angle 60°.



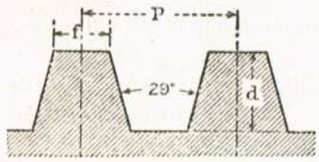
$P = \text{Pitch} = \dfrac{1}{\text{No. of threads per m/m}}$

d = Angular depth = ·868 P

t = Truncation at top and filling in at bottom = ·125 d or ·10825 P

D = Actual depth = ·6495 P

F.—International Metric Thread.
Angle 60°.



$P = \text{Pitch} = \dfrac{1}{\text{No. of threads per inch}}$

d = depth = $\frac{1}{2}$ P + ·010

f = flat on top of thread = P × ·3707

G.—Acme Standard Thread.
Angle 29°.

British Standard Fine Screw Threads.

Full Diameter.	No. of Threads per inch.	Pitch.	Depth of Thread.	Effective Diameter.	Core Diameter.	Cross Sectional Area at Bottom of Thread.
Ins.		Ins.	Ins.	Ins.	Ins.	Sq. in.
$\frac{1}{4}$ (·25)	26	·03846	·02465	·2254	·2007	·0316
$\frac{9}{32}$ (·28125)	26	·03846	·02465	·2566	·2320	·0423
$\frac{5}{16}$ (·3125)	22	·04545	·02910	·2834	·2543	·0508
$\frac{3}{8}$ (·375)	20	·05000	·03200	·3430	·3110	·0760
$\frac{7}{16}$ (·4375)	19	·05556	·03555	·4019	·3664	·1054
$\frac{1}{2}$ (·5)	16	·06250	·04000	·4600	·4200	·1385
$\frac{9}{16}$ (·5625)	16	·06250	·04000	·5225	·4825	·1828
$\frac{5}{8}$ (·625)	14	·07143	·04575	·5793	·5335	·2235
$\frac{11}{16}$ (·6875)	14	·07143	·04575	·6418	·5960	·2790
$\frac{3}{4}$ (·75)	12	·08333	·05335	·6966	·6433	·3250
$\frac{13}{16}$ (·8125)	12	·08333	·05335	·7591	·7058	·3913
$\frac{7}{8}$ (·875)	11	·09091	·05820	·8168	·7586	·4520
(·9375)	11	·09091	·05820	·8793	·8211	·5295
1	10	·10000	·06405	·9369	·8719	·5971
$1\frac{1}{8}$ (1·125)	9	·11111	·07115	1·0539	·9872	·7585
$1\frac{1}{4}$ (1·25)	9	·11111	·07115	1·1789	1·1077	·9637
$1\frac{3}{8}$ (1·375)	8	·12500	·08005	1·2950	·12149	1·1593
$1\frac{1}{2}$ (1·5)	8	·12500	·08005	·14200	1·3399	1·4100
$1\frac{5}{8}$ (1·625)	8	·12500	·08005	1·5450	1·2649	1·6854
$1\frac{3}{4}$ (1·75)	7	·14286	·09150	1·6585	1·5670	1·9285
$1\frac{7}{8}$ (1·875)	7	·14286	·09150	1·7835	1·6920	2·2485
2	7	·14286	·09150	1·9085	1·8170	2·5930
$2\frac{1}{8}$ (2·125)	7	·14286	·09150	2·0335	1·9120	2·9620
$2\frac{1}{4}$ (2·25)	6	·16667	·10670	2·1423	2·0366	3·2576
$2\frac{3}{8}$ (2·375)	6	·16667	·10670	2·2683	2·1616	3·6698
$2\frac{1}{2}$ (2·5)	6	·16667	·10670	2·3933	2·2866	4·1065
$2\frac{5}{8}$ (2·625)	6	·16667	·10670	2·5183	2·4116	4·5677
$2\frac{3}{4}$ (2·75)	6	·16667	·10670	2·6433	2·5366	5·0535
$2\frac{7}{8}$ (2·875)	6	·16667	·10670	2·7683	2·6616	5·5639
3	5	·20000	·12805	2·8719	2·7439	5·9133

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TABLES.

BAR IRON AND STEEL.

Flat Sections.

Width in Inches.	Thickness in inches, $\frac{3}{16}$ A	$\frac{1}{4}$ A	$\frac{5}{16}$ A	$\frac{3}{8}$ A	$\frac{7}{16}$ A	$\frac{1}{2}$ A	$\frac{5}{8}$ A	$\frac{3}{4}$ A	$\frac{7}{8}$ A	1 A
1 ...	0·63	0·84	1·05	1·26	1·47	1·68	2·11	2·53	2·95	3·37
$1\frac{1}{8}$ ...	0·71	0·95	1·18	1·42	1·66	1·9	2·37	2·84	3·32	3·79
$1\frac{1}{4}$ ...	0·79	1·05	1·32	1·58	1·84	2·11	2·63	3·16	3·68	4·21
$1\frac{3}{8}$ ...	0·87	1·16	1·45	1·75	2·03	2·32	2·89	3·47	4·05	4·63
$1\frac{1}{2}$ ...	0·95	1·26	1·58	1·9	2·21	2·53	3·16	3·79	4·42	5·05
$1\frac{5}{8}$ ...	1·03	1·37	1·71	2·05	2·39	2·74	3·42	4·11	4·79	5·47
$1\frac{3}{4}$ ...	1·11	1·47	1·84	2·21	2·58	2·95	3·68	4·42	5·16	5·89
$1\frac{7}{8}$ ...	1·18	1·58	1·97	2·37	2·76	3·16	3·95	4·74	5·53	6·32
2 ...	1·26	1·68	2·11	2·53	2·95	3·37	4·21	5·05	5·89	6·74
$2\frac{1}{8}$ ...	1·34	1·79	2·24	2·68	3·13	3·58	4·47	5·37	6·26	7·16
$2\frac{1}{4}$ ...	1·42	1·9	2·37	2·84	3·32	3·79	4·74	5·68	6·83	7·85
$2\frac{3}{8}$ ...	1·5	2·0	2·5	3·0	3·5	4·0	5·0	6·0	7·0	8·0
$2\frac{1}{2}$ ...	1·58	2·11	2·63	3·16	3·58	4·21	5·26	6·32	7·37	8·42
$2\frac{5}{8}$ ...	1·66	2·21	2·76	3·32	3·87	4·42	5·53	6·63	7·74	8·84
$2\frac{3}{4}$ ...	1·74	2·32	2·89	3·47	4·05	4·63	5·79	6·95	8·1	9·26
$2\frac{7}{8}$ ...	1·82	2·42	3·03	3·63	4·24	4·84	6·05	7·26	9·47	9·68
3 ...	1·9	2·53	3·16	3·79	4·42	5·05	6·32	7·58	8·84	10·1
$3\frac{1}{4}$ ...	2·05	2·74	3·42	4·11	4·79	5·47	6·84	8·21	9·58	10·95
$3\frac{1}{2}$ ...	2·21	2·95	3·68	4·42	5·16	5·89	7·37	8·84	10·32	11·79
$3\frac{3}{4}$ ...	2·37	3·16	3·95	4·74	5·53	6·32	7·89	9·47	11·05	12·63
4 ...	2·53	3·37	4·21	5·05	5·89	6·74	8·42	10·1	11·79	13·47
$4\frac{1}{4}$ ...	2·68	3·58	4·47	5·37	6·26	7·16	8·95	10·74	12·53	14·31
$4\frac{1}{2}$ ...	2·84	3·79	4·74	5·68	6·63	7·58	9·47	11·38	13·26	15·16
$4\frac{3}{4}$ ...	3·0	4·0	5·0	6·0	7·0	8·0	10·0	12·0	14·0	16·0
5 ...	3·16	4·21	5·26	6·32	7·37	8·42	10·53	12·63	14·74	16·84
$5\frac{1}{4}$ ...	3·32	4·42	5·53	6·63	7·74	8·84	11·05	13·26	15·47	17·68
$5\frac{1}{2}$ ...	3·47	4·63	5·79	6·95	8·1	9·26	11·58	13·89	16·21	18·52
$5\frac{3}{4}$ ...	3·63	4·84	6·05	7·26	8·47	9·68	12·1	14·53	16·95	19·37
6 ...	3·79	5·05	6·32	7·58	8·84	10·15	12·63	15·16	17·68	20·21

(A) Weight in lbs. per foot.

Round and Square Sections.

Size Ins.	Round Weight in lb. per lineal foot.	Square Weight in lb. per lineal foot.	Round Weight in kilos per metre.	Square Weight in kilos per metre.	Size Ins.	Round Weight in lb. per lineal foot.	Square Weight in lb. per lineal foot.	Round Weight in kilos per metre.	Square Weight in kilos per metre.
$\frac{3}{16}$	0·092	0·017	·137	·174	$2\frac{1}{4}$	13·25	16 ·87	19·72	25·10
$\frac{1}{4}$	0·164	0·208	·244	·309	$2\frac{1}{2}$	16·36	20·83	24·34	30·99
$\frac{5}{16}$	0·256	0·326	·381	·485	$2\frac{3}{4}$	19·80	25·21	29·46	37·51
$\frac{3}{8}$	0·368	0·469	·547	·698	3	23·56	30·00	35·05	44·64
$\frac{7}{16}$	0·501	0·638	·759	·949	$3\frac{1}{4}$	27·65	35·21	41·14	52·39
$\frac{1}{2}$	0·654	0·833	·973	1·239	$3\frac{1}{2}$	32·07	40·83	47·72	60·75
$\frac{5}{8}$	1·023	1·302	1·522	1·937	$3\frac{3}{4}$	36·82	46·87	54·79	69·74
$\frac{3}{4}$	1·473	1·875	2·192	2·790	4	41·89	53·33	62·33	79·35
$\frac{7}{8}$	2·004	2·552	2·982	3·797	$4\frac{1}{4}$	47·29	60·21	70·37	89·59
1	2·618	3·333	3·895	4·959	$4\frac{1}{2}$	53·01	67·50	78·88	100·44
$1\frac{1}{8}$	3·313	4·219	4·930	6·278	$4\frac{3}{4}$	59·07	75·21	87·90	111·91
$1\frac{1}{4}$	4·091	5·208	6·087	7·749	5	65·45	83·33	97·39	123·99
$1\frac{3}{8}$	4·950	6·302	7·365	9·377	$5\frac{1}{4}$	72·16	91·87	107·37	136·70
$1\frac{1}{2}$	5·890	7·500	8·764	11·160	$5\frac{1}{2}$	79·19	100·83	117·83	150·03
$1\frac{3}{4}$	8·018	10·208	11·931	15·189	$5\frac{3}{4}$	86·56	110·21	128·80	163·99
2	10·472	13·333	15·582	19·939	6	94·25	120·00	140·25	178·56

Steel is 2 per cent. heavier.

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TABLES.

Equal Angles.

British Standard Sections.

Size In.	Standard thickness In.	Weight in lb. per foot	Weight in kilos per metre
1 × 1	0·125	0·80	1·19
	0·250	1·49	2·22
1¼ × 1¼	0·125	1·02	1·52
	0·250	1·92	2·86
1½ × 1½	0·125	1·23	1·83
	0·250	2·34	3·48
1¾ × 1¾	0·175	1·98	2·95
	0·300	3·27	4·86
2 × 2	0·175	2·28	3·39
	0·300	3·77	5·61
2¼ × 2¼	0·175	2·57	3·82
	0·300	4·28	6·37
2½ × 2½	0·250	4·04	6·01
	0·375	5·89	8·76
	0·500	7·65	11·38
2¾ × 2¾	0·250	4·46	6·64
	0·375	6·53	9·72
	0·500	8·50	12·65
3 × 3	0·250	4·90	7·29
	0·375	7·18	10·68
	0·500	9·36	13·93
3½ × 3½	0·300	6·84	10·18
	0·425	9·50	14·14
	0·500	11·05	16·44
4 × 4	0·300	7·85	11·68
	0·425	10·94	16·28
	0·500	12·75	18·97
4½ × 4½	0·375	11·00	16·37
	0·500	14·46	21·52
5 × 5	0·375	12·27	18·26
	0·500	16·15	24·03
6 × 6	0·450	17·68	26·31
	0·625	24·18	35·98
7 × 7	0·500	22·97	34·18
	0·675	30·60	45·53
8 × 8	0·550	28·89	42·99
	0·750	38·89	57·87

Tee Bars.

British Standard Sections.

Size In.	Standard thickness In.	Weight in lb. per foot	Weight in kilos per metre
1 × 1	0·125	0·82	1·22
	0·187	1·17	1·74
1¼ × 1¼	0·125	1·03	1·53
	0·187	1·49	2·22
1½ × 1½	0·187	1·81	2·69
	0·250	2·35	3·50
1¾ × 1¾	0·187	2·14	3·18
	0·250	2·79	4·15
1½ × 2	0·250	2·79	4·15
	0·312	3·40	5·06
2 × 2	0·250	3·22	4·79
	0·312	3·94	5·86
	0·375	4·64	6·90
2¼ × 2¼	0·250	3·64	5·42
	0·312	4·47	6·65
	0·375	5·28	7·86
2½ × 2½	0·250	4·07	6·06
	0·312	5·00	7·44
	0·375	5·92	8·81
3 × 2	0·312	5·01	7·45
	0·375	5·93	8·82
3 × 2½	0·312	5·53	8·23
	0·375	6·56	9·76
3 × 3	0·312	6·08	9·05
	0·375	7·21	10·73
	0·437	8·30	12·35
3 × 4	0·375	8·48	12·62
	0·500	11·07	16·47
3½ × 3½	0·375	8·49	12·63
	0·437	9·78	14·55
	0·500	11·08	16·49
4 × 3	0·375	8·49	12·63
	0·500	11·08	16·49
4 × 4	0·375	9·77	14·54
	0·500	12·78	19·02
4 × 5	0·375	11·06	16·46
	0·500	14·50	21·58
5 × 3	0·375	9·78	14·55
	0·500	12·79	19·03
5 × 3½	0·500	13·66	20·33
5 × 4	0·500	14·51	21·59
6 × 3	0·375	11·08	16·49
	0·500	14·53	21·62
6 × 4	0·500	16·22	24·13
7 × 3½	0·500	17·08	25·41

Steel Chequered Plates.

(Weight per Square Foot.)

Thickness on plain part	3/16	1/4	5/16	3/8	7/16	½ in.
Ordinary diamond (5× 1in.) ...	9½	11¾	14	16½	19	21½ lb.
Admiralty diamond (2× 1in.)...	8¾	11	13½	15¾	18¼	20½ ,,
Maximum length	20	25	25	25	25	25 ft.
Maximum width	52	54	55	55	55	55 in.

Cast S. and S. Pipes.

(Average Weight per Length.)

In.	Lbs.	In.	Lbs.	In.	Lbs.	In.	Lbs.
2*	42	4	154	7	316	10	528
2½*	61	5	203	8	392	12	698
3*	98	6	256	9	430		

* 6 ft. long. Rest 9 ft.

Unequal Angles.

British Standard Sections.

Size In.	Standard thickness In.	Weight in lb. per foot	Weight in kilos per metre
1¼ × 1	0·125	0·90	1·34
	0·250	1·70	2·53
1½ × 1¼	0·125	1·11	1·65
	0·250	2·12	3·15
1¾ × 1½	0·175	1·83	2·72
	0·301	3·01	4·47
2 × 1½	0·175	1·98	2·95
	0·300	3·27	4·86
2½ × 2	0·175	2·57	3·82
	0·300	4·28	6·37
3 × 2	0·250	4·04	6·01
	0·375	5·89	8·76
	0·500	7·65	11·38
3 × 2½	0·250	4·46	6·64
	0·375	6·53	9·72
	0·500	8·50	12·65
3½ × 2½	0·250	4·90	7·29 4½
	0·375	7·18	10·68
	0·500	9·36	13·93
3½ × 3	0·250	5·31	7·90
	0·375	7·81	11·62
	0·500	10·20	15·18
4 × 2½	0·250	5·31	7·90
	0·375	7·81	11·62
	0·500	10·20	15·18
4 × 3	0·300	6·84	10·18
	0·425	9·50	14·14
	0·500	11·05	16·44
4 × 3½	0·300	7·34	10·92
	0·425	10·22	15·21
	0·500	11·90	17·71
4½ × 3	0·300	7·34	10·92
	0·425	10·22	15·21
	0·500	11·90	17·71
4½ × 3½	0·300	7·85	11·68
	0·425	10·94	16·28
	0·500	12·75	18·97
5 × 3	0·300	7·85	11·68
	0·425	10·94	16·28
	0·500	12·75	18·97
5 × 3½	0·375	10·37	15·43
	0·500	13·61	20·25
5 × 4	0·375	11·00	16·37
	0·500	14·46	21·52
5½ × 3	0·375	10·37	15·43
	0·500	13·61	20·25
5½ × 3½	0·375	11·00	16·37
	0·500	14·46	21·52
6 × 3½	0·375	11·64	17·32
	0·500	15·31	22·78
6 × 4	0·375	12·27	18·26
	0·500	16·15	24·03
6½ × 3½	0·375	12·27	18·26
	0·500	16·15	24·03
6½ × 4	0·525	17·81	26·50
6½ × 4½	0·550	19·54	29·07
7 × 3½	0·525	17·81	26·50
7 × 4	0·550	19·54	29·07
7 × 3½	0·575	21·37	31·80
8 × 4	0·652	24·18	35·98
9 × 4	0·650	27·30	40·62
10 × 4	0·675	30·60	45·53

Cast Iron Pipes for Steam, etc.

(Weight per Foot of Plain Pipes in Lbs.)

Dia. of Bore.	Thickness of Metal in Inches.							
Ins.	3/8 Lbs.	½ Lbs.	5/8 Lbs.	¾ Lbs.	7/8 Lbs.	1 Lbs.	1⅛ Lbs.	1¼ Lbs.
2	8·8	12·4	16·3	20·4				
2½	10·7	14·9	19·4	24·1				
3	12·5	17·4	22·4	27 8	33·6	39·7	46·0	
3½	14·4	19·9	25·5	31 5	37·9	44·7	50·6	
4	16·2	22·3	28·6	35 2	42·3	49·6	57·1	65·1
4½	18·1	24·8	31·7	38·9	46·7	54·6	62·7	71·2
5	20·0	27·3	34·9	42·7	51·0	59·5	68·3	77·4
5½	21·9	29·8	38·0	46·4	55·3	64·5	73·9	83·4
6	23·7	32·2	31·1	50·1	59·6	69·4	79·4	89·8
6½	26·6	34·7	44·2	53·8	63·9	74·4	85·0	96·0
7	27·4	37·2	47·3	57·5	68·3	79·3	90·6	102·2
7½	29·3	39·7	50·4	61·2	72·6	84·3	96·2	108·4
8	31·1	42·2	53·5	65·0	77·0	89·3	101·8	114·6
8½	33·0	44·7	56·6	68·7	81·3	94·3	107·4	120·3
9	34·9	47·1	59·6	72·4	857·	99·2	112·9	127·0
9½	36·8	49·6	62·7	75·6	90·0	104·2	118·5	133·2
10	38·6	52·1	65·8	79·9	94·3	109·1	124·1	139·4
10½		54·6	68·9	82·8	98·6	114·1	129·7	145·6
11		57·0	72·0	87·3	103·0	119·0	135·2	151·8
11½		59·6	75·1	90·4	107·3	124·0	140·8	158·0
12		62·0	78·2	94·7	111·7	128·9	146·4	164·2
13			84·4	102·2	120·4	138·8	157·5	176·6
14			90·6	109·6	129·0	148·8	168·7	189·0
15			96·8	117·0	137·7	158·7	179·8	201·4
16				124·6	146·4	168·6	181·0	213·8
17				131·9	155·1	178·5	202·1	224·2
18				138·2	162·1	186·5	211·2	236·2
20					179·3	206·2	233·3	260·8
22						225·8	255·4	285·4
24						245·5	277·3	310·0

Two flanges are generally estimated as equal to one foot of pipe.

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STEEL JOISTS AND CHANNELS.

TABLES OF WEIGHTS AND STRAINS.

Table of Safe Distributed Loads in Tons on Beams of varying Spans.

Size. Ins.	Wt. per ft. lbs.	SPANS IN FEET. 4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44
24 × 7½	100				102	92	79	69	61	55	50	46	42	39	36	34	32	30	29	27	26	25
20 × 7½	89			94	83	69	59	52	46	41	38	34	32	29	27	26	24	23	22	20		
20 × 6¼	65			69	59	49	42	37	33	29	27	25	23	21	20	18	17	16	15·5	15		
18 × 7	75			78	64	53	45	40	35	32	29	26	24	22	21	20	18	17	16			
18 × 6	55		60	56	45	37	32	28	25	22	20	19	17	16	15	14	13	12·5	12			
16 × 6	62		73	56	45	38	32	28	25	22	20	19	17	16	15	14	13	12	11	11		
15 × 6	59		62	52	42	35	30	26	23	21	19	17	16	15	14	13	12	11				
15 × 5	42		47	35	28	24	20	18	16	14	13	12	11	10	9·5	9	8·4					
14 × 6	57		59	47	38	31	27	24	21	19	17	16	14	13	12							
14 × 6	46		43	39	31	26	22	19	17	15	14	13	12	11	10							
12 × 6	54	53	52	39	31	26	22	19	17	15	14	13	12	11	10							
12 × 6	44		40	33	26	22	19	16	14	13	12	11	10	9								
12 × 5	39	45	36	27	22	18	15	13	12	11	9·9	9	8·3	7·7	7·2							
12 × 5	32	32	30	23	18	15	13	11	10	9	8·3	7·6	7	6·5								
10 × 8	70		53	43	34	28	24	21	19	17	15	14	13									
10 × 6	42		35	26	21	17	15	13	11	10	9·6	8·8	8									
10 × 5	35	37	28	21	17	14	12	10	9·3	8·4	7·6	7	6·4									
10 × 5	30	30	24	18	14	12	10	9	8	7·2	6·6	6	5·6									
10 × 4·66	25	24	20	15	12	10	9	8	6·8	6·1	5·6	5·1	4·7	4·4	4·1							
9 × 7	58	44	42	32	25	21	18	16	14	12	11	10	9·8									
9½ × 3¾	21·5	22	15	11	9	7·5	6·4	5·6	5	4·5	4·1	3·7	3·5									
9 × 4	21	22	15	11	9	7·5	6·4	5·6	5	4·5	4	3·7										
8 × 6	35	31	23	17	14	11	9·8	8·6	7·7	7	6·3											
8 × 5	28	25	18	14	11	9	8	7	6·2	5·5	5											
8 × 4	18	17	11	8·7	7	5·8	5	4·3	3·8	3·5	3·2											
7 × 4	16	14	9·4	7	5·6	4·7	4	3·5	3·1	2·8	2·5											
6 × 5	25	18	12	9	7·3	6	5·2	4·5	4													
6 × 4½	20	14	9·6	7·2	5·8	4·8	4·1	3·6	3·2													
6 × 3	12	8·4	5·6	4·2	3·4	2·8	2·4	2·1	1·9													
5 × 4½	18	11·3	7·6	5·6	4·5	3·8	3·2	2·8														
5 × 3	11	6·8	4·5	3·4	2·7	2·3	1·9	1·7														
4¾ × 1¾	6·5	3·5	2·4	1·8	1·4	1·2	1															
4 × 3	9·5	4·7	3·1	2·3	1·9	1·6	1·3															
4 × 1¾	5	2·3	1·5	1·1	·91	·76	·65															
3 × 3	8·5	3·2	2	1·6	1·2	1	·9															
3 × 1½	4	1·4	·92	·6	·55	·46	·39															

NOTES.— 1. A large Stock of these Sections is kept at Shepherd's Bush.

2. Loads are calculated at a factor of safety of four.

3. Depth of Beam selected should not be less than one-twentieth of span, otherwise excessive deflection may occur.

ROLLED STEEL BEAMS.

Deflection when stressed to 7.5 tons per sq. inch.

D'p'h	SPANS IN FEET. 6	8	10	12	14	16	18	20	22	24	26	28	30	32	34
3″	·2	·37	·58	·83	1·13										
4″	·15	·27	·43	·62	·85	1·1	1·4								
5″	·12	·22	·34	·5	·68	·89	1·1	1·4							
6″	·1	·18	·29	·41	·57	·74	·94	1·16							
7″	·08	·15	·25	·35	·48	·63	·8	·99	1·2	1·43					
8″	·07	·13	·21	·31	·42	·56	·7	·87	1·05	1·25					
9″	·06	·12	·19	·27	·38	·49	·62	·77	·93	1·11	1·3				
10″	·06	·11	·17	·25	·34	·44	·56	·69	·8	1	1·18				
12″	·05	·09	·14	·2	·28	·37	·47	·58	·7	·8	·9	1·14			
14″	·04	·07	·12	·17	·24	·31	·4	·49	·6	·7	·8	·97	1·12	1·27	
15″	·04	·07	·11	·16	·22	·29	·37	·46	·56	·66	·78	·9	1	1·2	1·3
16″	·03	·06	·1	·15	·21	·27	·35	·43	·52	·62	·73	·85	·98	1·1	1·2
18″	·03	·06	·09	·13	·19	·24	·31	·38	·46	·5	·65	·75	·87	·9	1·1
20″	·03	·05	·08	·12	·17	·22	·28	·34	·42	·5	·58	·68	·78	·89	1
24″	·02	·04	·07	·11	·15	·19	·25	·3	·37	·44	·5	·6	·7	·79	·9

ROLLED STEEL CHANNELS.

Safe Loads in Tons uniformly distributed.

Size inches	Weight per foot	SPANS IN FEET. 4	6	8	10	12	14	16	18	20	22	24	26	28
12×3½	33	39	26	20	15	13	11	9·7	8·5	7·6	7	6·2	5·7	5·2
9×4	28·5	28	19	14	11	9	8	7	6	5·3	4·8			
9×3	19·3	18	12	9	7	6	5	4	3·7	3·4	3			
8×4	25·7	23	15	11·5	9	7·5	6·4	5·6	5	4·3				
8×3½	24	20	13	10	8	6·5	5·5	4·8	4·2	3·8				
8×3	19·3	16	11	8·2	6·5	5·4	4·6	4	3·5	3				
7×3½	20·2	16	10·5	8	6·2	5	4·4	3·8	3·3					
7×3	17·56	13	9	6·6	5·2	4·3	3·7	3·2	2·8					
6×3½	17·9	12	8	6	4·8	4	3·4	3						
6×3	14·5	10	6·6	5	4	3·2	2·7	2·4						
5×2½	10·98	6	4	3	2·3	1·9	1·6							
4×2	7·96	3·5	2·3	1·7	1·4	1·1								
3½×2½	6·87	2·7	1·8	1·37	1·08									
3½×2	6·75	2·6	1·7	1·3	1									
3×1½	5·27	1·6	1·1	·8										

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